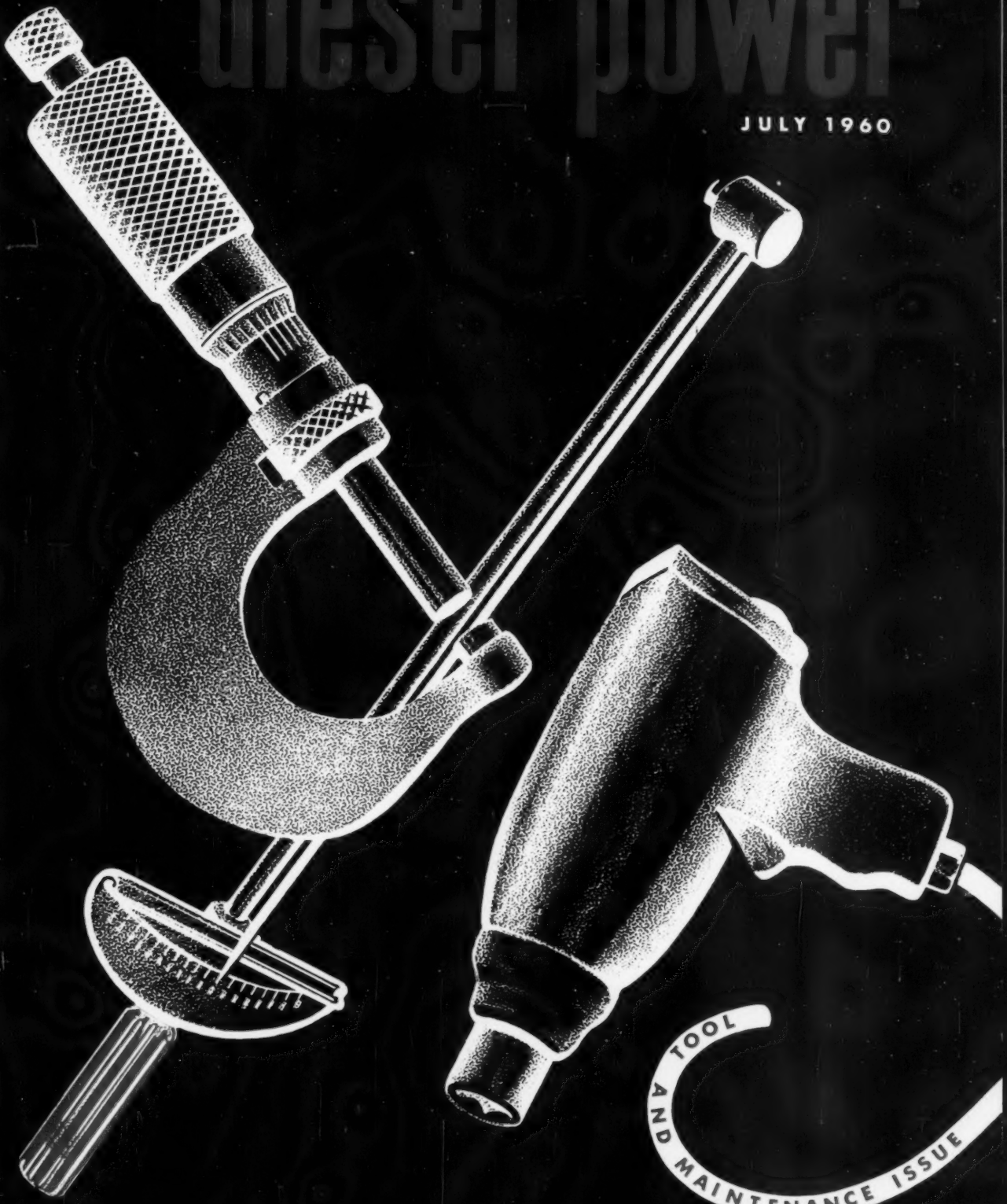
diesel power

JULY 1960



TOOL AND MAINTENANCE ISSUE

WHAT'S IN THE FUTURE FOR DIESEL TAXIS?

Latest developments show engine builders aim for new market by hitting old problems of size and weight

Surveys undertaken by foreign and domestic firms alike indicate that American owners of light- and mediumweight fleets, faced with continuously rising operating costs, have developed into a very promising market for compact, lightweight, high-speed diesel engines. Performance records of various types of these vehicles, experimentally equipped with diesel engines, show that taxi fleets are among the most susceptible to important operating economies through dieselization.

Typical taxis travel an average of 20,000 miles a year in thick city traffic. This type of operation not only sends fuel consumption soaring, but also has proved, according to recent research, to be the most detrimental in terms of engine wear.

Leading engine manufacturers say they're tailoring the diesel to taxi operating routine by producing engines that, pound for pound, turn out almost as much horsepower as gasoline engines.

Diesel taxi experience to date

There are already several hundred diesel taxis operating in the U.S., and performance records of these cars appear to bear up diesel engine builders' contention that some of the diesel's greatest economy advantages are obtained in stop-and-go-service.

Some of the advantages cited by diesel taxi owners include lower operating costs (about 50% less); longer periods between overhauls (up to 500,000 miles in some cases) and less costly overhauls when they're needed.

How it's being done

Different manufacturers offer different solutions to the requirements of taxi service. One manufacturer predicts that the biggest initial expense item on diesel engines, fuel injection systems and fuel pumps, will be eliminated by mass production. Other manufacturers say they have been able to cut down on the first-cost of engines by maximum interchangeability of parts. Detroit Diesel, for example, reports using only three bore sizes for their whole range of diesels. Hercules claims to have brought initial cost down to about $15 per horsepower by designing all crankshafts for diesel loads, by using common blocks for both gasoline and diesel engines, and by standardizing on only two ring sizes, two piston sizes, and identical con-rods and bearings in all engines.

Builders say they get more power out of lighter engines by supercharging and turbocharging, and by making large components, like flywheel housings, of aluminum and other lightweight metals. The newest Hercules diesels are said to weigh only about 5.5 pounds per horsepower.

To keep 'em rolling

Engine builders and petroleum manufacturers have been working hand-in-hand on the problem of optimum lubrication for these new engines. Texaco, for example, has compiled an outline of lubrication recommendations designed to keep an engine as clean as possible for as long as possible. For information write:

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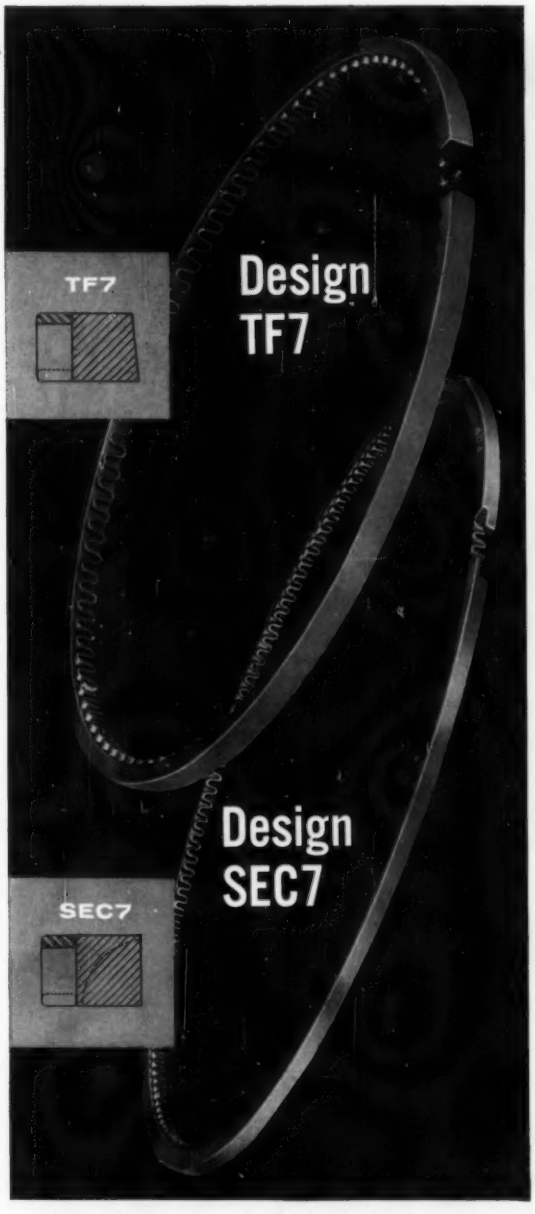

TF7 DESIGN—Pedrick Conformable Taper-Face Compression Ring. Taper face provides a line contact with the cylinder wall for quicker seating and sealing, less chance of scuffing. Used in combination with the exclusive "Equalizer" in certain grooves of Pedrick Engineered Installations according to engine conditions and operating requirements.

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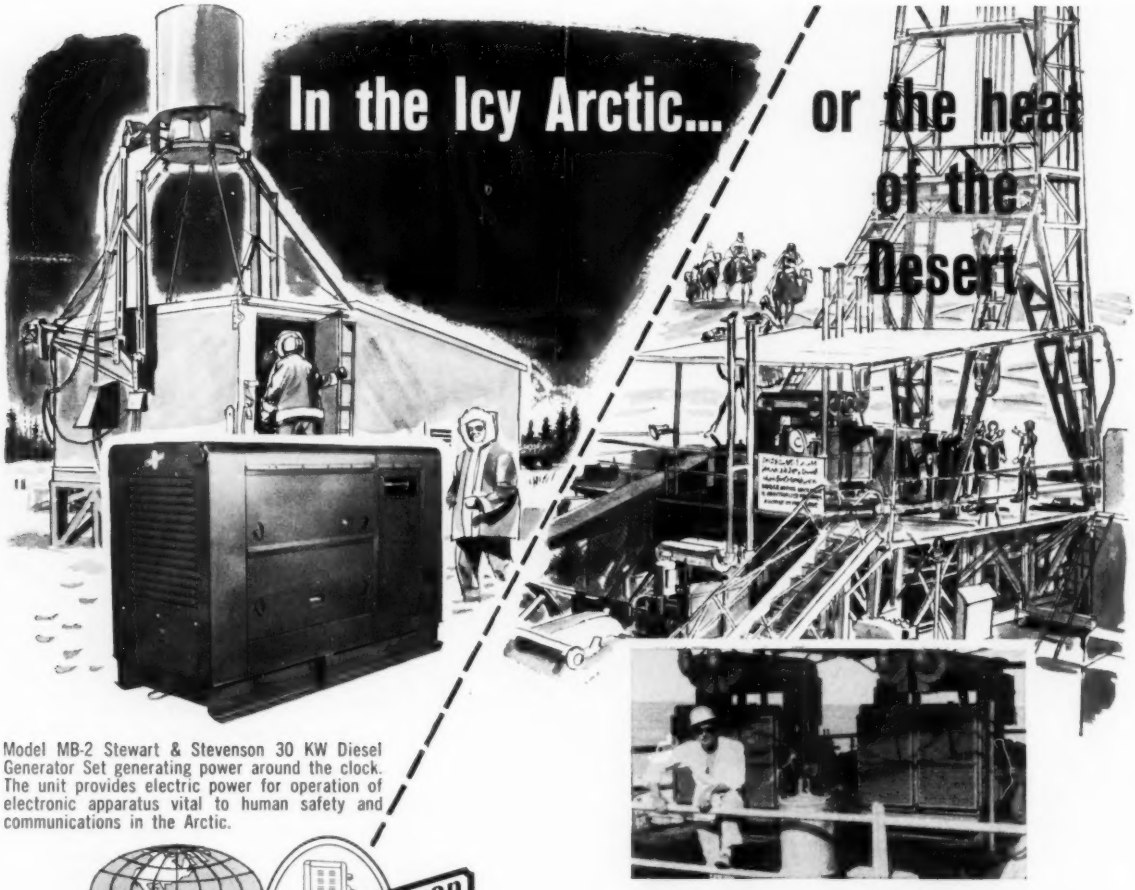

Model MB-2 Stewart & Stevenson 30 KW Diesel Generator Set generating power around the clock. The unit provides electric power for operation of electronic apparatus vital to human safety and communications in the Arctic.

Parker Drilling Company rig, powered with GM Model 12103 Diesel Engines. Lighting and auxiliary power are supplied by a Stewart & Stevenson oilfield Utility Unit and Rig Lighting Plant. The engines were properly equipped and modified by Stewart & Stevenson with special cooling and air intake systems.

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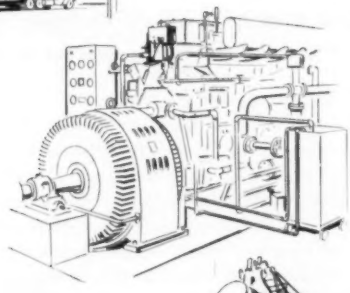

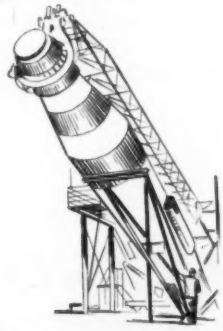

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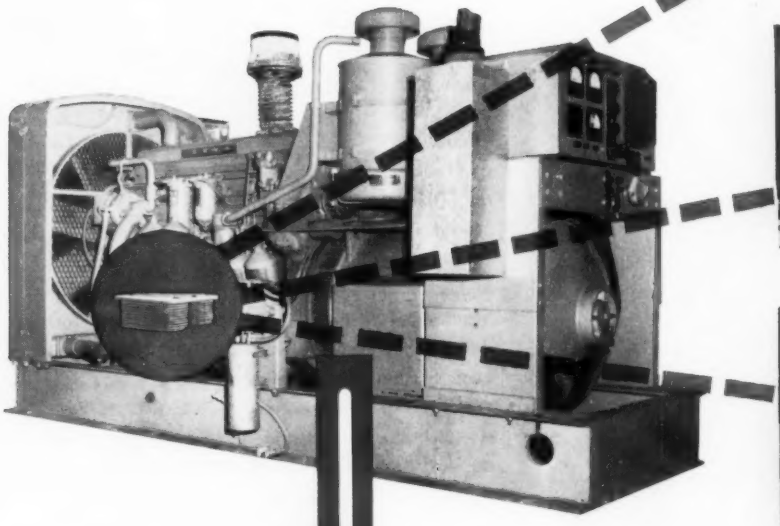

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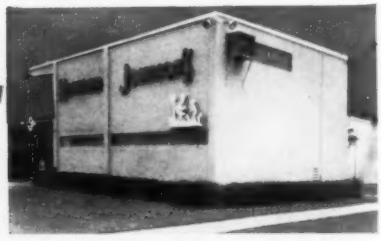

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ESTABLISHED IN 1923

JULY, 1960 VOL. 38 NO. 7

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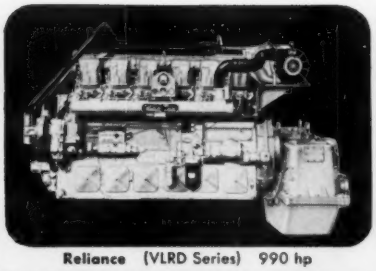

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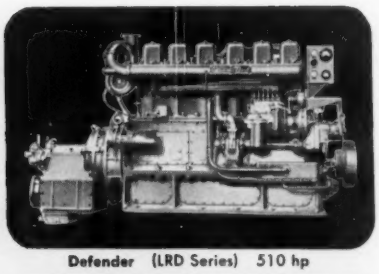

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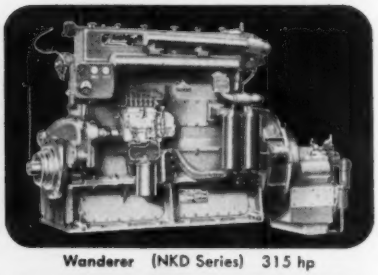

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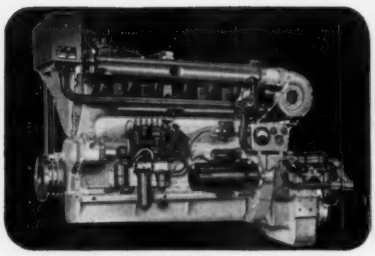

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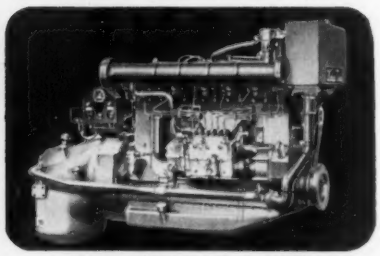

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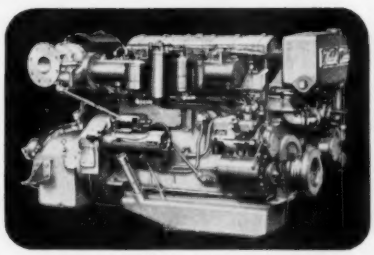

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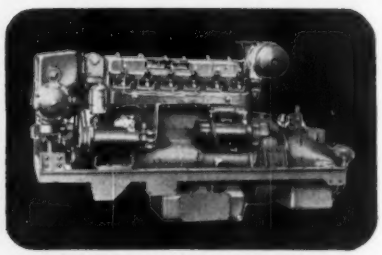

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DEFENDER	Normal	6	8½ x 8½	2894	335 hp @ 1215 rpm
	Turbo	6	8½ x 8½	2894	510 hp @ 1215 rpm
WANDERER	Normal	6	7 x 8¼	1905	240 hp @ 1215 rpm
	Turbo	6	7 x 8¼	1905	315 hp @ 1215 rpm
RESOLUTE	Normal	6	6¼ x 6½	1197	195 hp @ 1600 rpm
	Turbo	6	6¼ x 6½	1197	290 hp @ 1600 rpm
VIGILANT	Normal	6	5¼ x 6	779	150 hp @ 1800 rpm
	Turbo	6	5¼ x 6	779	195 hp @ 1800 rpm
CUTWATER	Normal	6	4¼ x 5	426	100 hp @ 2000 rpm
	Turbo	6	4¼ x 5	426	120 hp @ 2000 rpm
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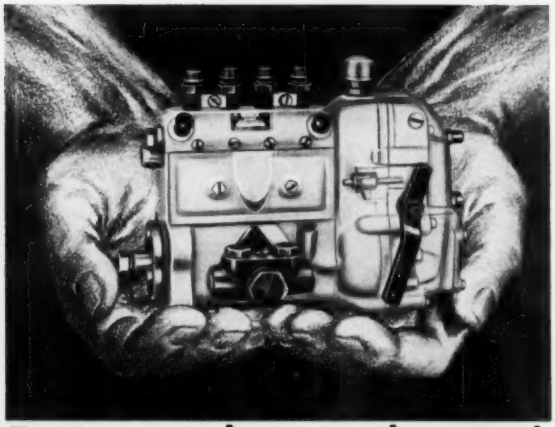

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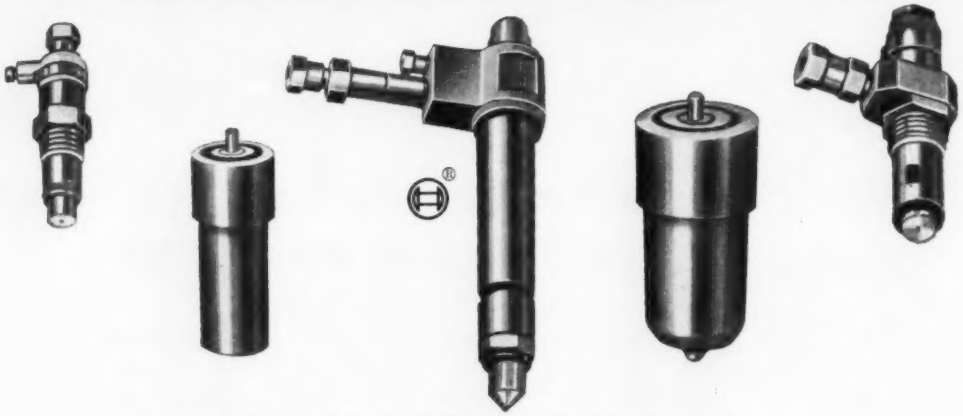

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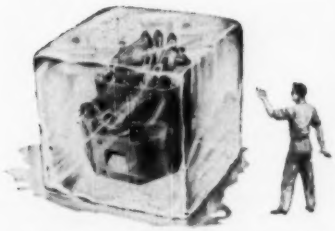

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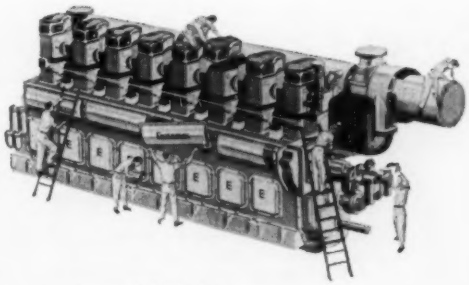

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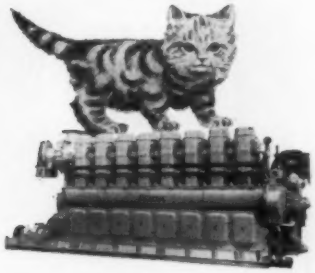

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For information contact:
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BOND LOC

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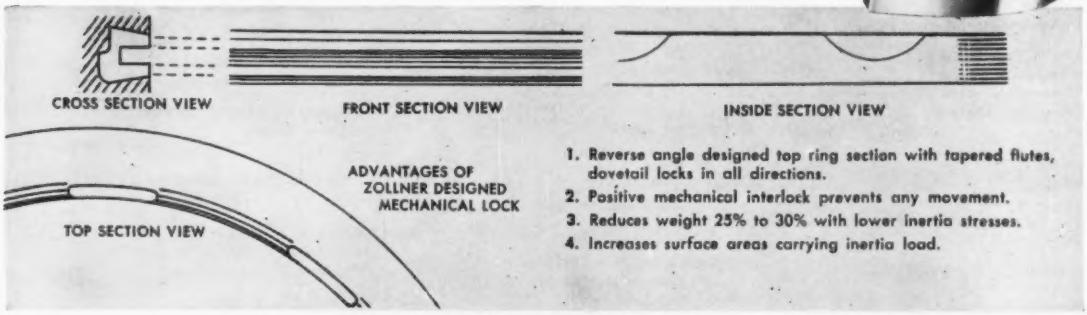
"Ni-Resist" IRON TOP RING SECTION
METALLURGICALLY A1-Fin Process
MECHANICALLY Zollner Lock

Design adaptable to any type pistons

Stops Ring Groove Wear

Everywhere, engine builders and transport operators enthuse over the performance of Zollner Bond-O-Loc Pistons — "The greatest mileage piston we have ever used. Top ring groove wear problems are eliminated by the 'Ni-Resist' Iron section **permanently** incorporated with the double bond of both A1-Fin metallurgic **and the exclusive** Zollner mechanical lock." For longer piston life, better performance and lower maintenance cost, we suggest your immediate test of Bond-O-Loc advantages.



1. Reverse angle designed top ring section with tapered flutes, dovetail locks in all directions.
2. Positive mechanical interlock prevents any movement.
3. Reduces weight 25% to 30% with lower inertia stresses.
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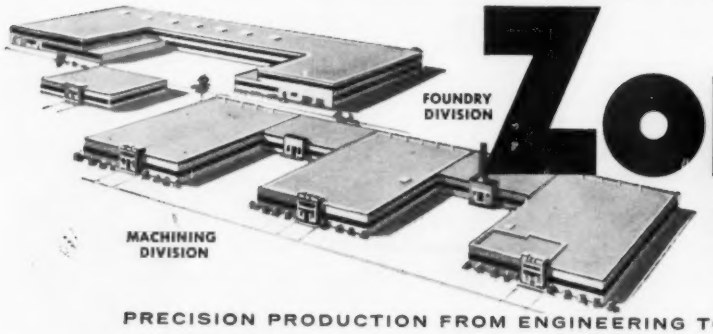


ZOLLNER
HEAVY DUTY PISTONS

PRECISION PRODUCTION FROM ENGINEERING TO FOUNDRY TO FINISHED PISTONS

diesel power

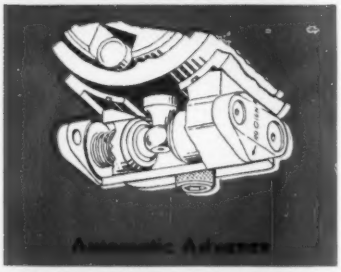
editorially speaking

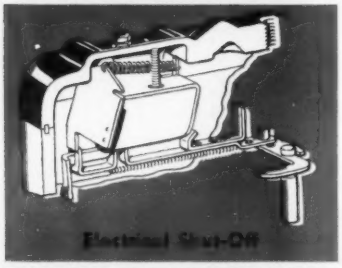
Bigger Diesel Industry — Bigger Service Industry!

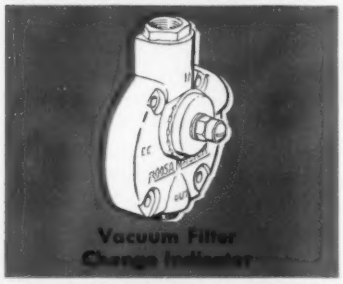
By now you're aware that we're all for diesels in the smaller vehicles. When we started promoting this idea some years ago (others have since grabbed our coattails) there was only a vision of what it could do for our industry . . . no experience. But it worked abroad and conditions were beginning to favor adoption of the idea here. Any last reservations we might have had were erased by opportunity to see at first hand what's going on in Germany and England right now. Diesel-powered vehicles of all types and sizes are just all over the place. In the smaller sizes they split up in various proportions with gasoline rigs but in medium to large sizes, it's diesel all the way. In German cities visited, all taxis seen were 180D or 190D Mercedes-Benz models . . . in London they were the "Scotland Yard" Austin cabs with BMC diesels. One German gentleman, asked about percentage of diesel tractors, replied, "All are diesel." His tone implied, "What else?" Point is that while their diesel engine production is brisk for all applications, vehicular use absorbs the highest single percentage. Adding industrial versions of the same engines, production volume in certain sizes and types is remarkably high. This activity is reflected on down the line. In Germany, for example, Robert Bosch in a year makes a whole lot more of their PE-type pumps alone than the total annual production of diesel engines in this country! Nozzles run into the millions! And seeing this dense diesel population makes you think that someone has to take care of them . . . provide parts, accessories, supplies, service tools—and service. Engine sales are just the top of the pyramid; the supporting base is many times broader. And we can and will have this in our country—perhaps bigger. Let's all get behind and push the idea. Then we'll have a bigger and better industry sooner.

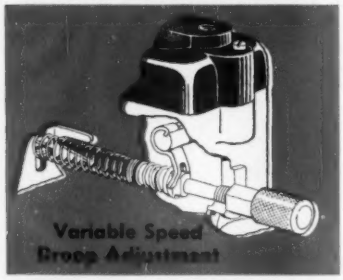
B. P. E.

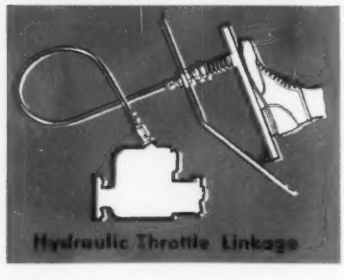
A few accessories that add versatility:

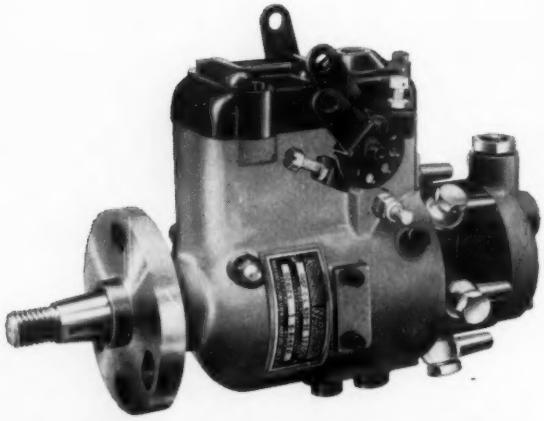












ROOSA MASTER

Most Versatile
FUEL INJECTION PUMP

Diesel engine manufacturers, their designers and engineers are specifying ROOSA MASTER because they know that it is the most versatile. There are many reasons for selecting this pump. Here are just a few:

- **VERSATILE** because of the variety of built-in, space saving, accessories demanded by modern diesel engine design. Roosa Master can provide more compact, lower cost, complete units to meet many different applications.
- **VERSATILE** because only one size pump serves either a 2, 3, 4, 6, or 8 cylinder, 2 or 4 cycle, small or large displacement engine . . . and only Roosa Master can be mounted vertically or horizontally.
- **VERSATILE** because it is applicable to automotive, construction, farm, generator, marine and stationary equipment guaranteeing dependable, economical service. Write for further information.

HMS ROOSA MASTER makes good diesels better

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diesel power news section highlights

C-B WEIGHS EUROPEAN MOVE . . .

Cooper-Bessemer's President E. L. Miller reports they are currently taking a careful look at possibility of entering European Common Market. If-and-when, this would mean C-B's building a European plant and/or acquisition of existing facilities on the continent.

NEW PRODUCTS FROM THOMPSON-RAMO-WOOLDRIDGE . . .

There's news from Thompson-Ramo-Wooldridge's Valve Division of two new products—a new low-cost temperature-modulated fan designed to help maintain proper coolant temperature . . . and also, stemming from TRW's diesel turbocharger development and gas turbine machinery work, they have a new low-cost turbocharger engineered for gasoline engines.

LOW-VOLTAGE IGNITION BEING RESEARCHED AS STARTING AID . . .

In tests using low-voltage ignition, cold diesel engines have started in eight to ten seconds at -25°F. Fuel used was JP4 in a single-cyl, 4-cycle, air-cooled Onan and 3-cyl, 2-cycle liquid-cooled GM 3-71. Atwell, Brumback and Manthey of Electric Autolight report spark was required for approximately one minute while combustion chamber came up to temperature. Tests are continuing. . . .

I-H's "817" IMPORTANT NEW POWER PLANT FOR CONSTRUCTION FIELD . . .

International Harvester's "817" engine, introduced only in 1959, is already well on its way—powering five of I-H's earthmoving vehicles. The "817" supplies naturally-aspirated power for the off-highway 19-ton Payhauler truck . . . and turbocharged power for its bigger brother, the 27-ton Payhauler. I-H's new "817" also delivers turbocharged power for the 34-cu. yd 295 Payscraper and the 495 Paywagon. It's also currently the power plant in the front of their TD-25 Crawler . . . as well as in the 130,000-gcw DCOF-405 truck. These are the big toll road "Double Bottoms."

DIESEL'S SHARE OF SALES ARE UP "DOWN ON THE FARM" . . .

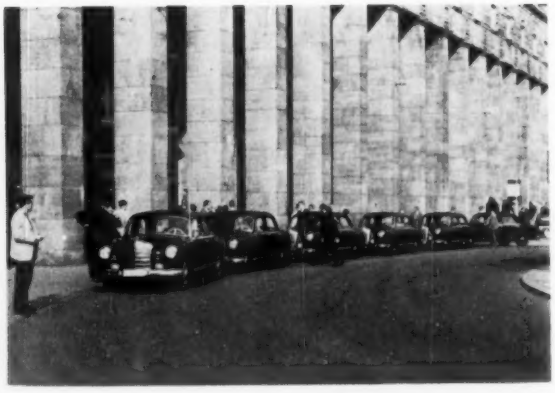
Today's American farmer has more makes of diesel tractors to choose from than ever before. American tractor manufacturers are upping their percentage of diesels . . . and add to this the ample offering of imports currently on the market. Late count shows over 20 different foreign diesel tractors vying for the farmer's eye. All adds up to a sizeable number of dieselized tractors — domestic and foreign—ready to pull the American plow. Implement and Tractor magazine reports that agricultural experts are now advocating a switchover to diesel whenever the farmer finds his tractor averaging 12 hours or better per week.

DIESEL PRODUCTION GENERALLY ACTIVE . . .

The farm tractor market mentioned above helps justify our January prediction of 30 per cent increased diesel sales. Other factors include: —progress in acceptance of diesels for lightload/shorthaul trucks plus taxi service, regained impetus in the roadbuilding program; plus generally increasing economic pressure for lower-cost prime mover power. Product development is also playing a part. Better hp/weight ratios, higher rpm's and longer service life are opening up new applications, here-to-fore impractical.

diesel power news section

Next stop Stuttgart, Germany! Partial group of Robert Bosch central distributors, some with families, that attended factory distributors meeting. Distributors (plus one assorted editor) saw production facilities and techniques . . . learned more about Robert Bosch and its products.



"Hail of two cities." At right, Mercedes-Benz 180D and 190D cabs in the taxi line at Stuttgart's railroad station. German cabbies really roll them . . . have nothing to learn from New York cabbies. At left, the diesel "London" cabs line up at Victoria Station. Watching them U-turn in a narrow street in traffic that makes New York's crosstown streets look like empty lots is quite an experience. All diesel; cabbies like 'em! One reported 150 miles-per-day, seven days-per-week, three years before engine changeout. Troubles? Minor—just a couple nozzle changeouts. Similar reports were received from German cabbies!

NEWS ABOUT PLACES, PEOPLE AND PLANTS FOLLOWS ►

NEWS SECTION . . .

Diesel-Powered Truck Sales Surge Ahead!

International Harvester reports multi-delivery of diesel-powered units to leading truckers engaged in extensive expansion and modernization programs.

Gateway Transportation's taken delivery of 131 diesel-powered highway truck-tractors amounting to $2-million plus in a major step toward diesel conversion of the Gateway over-the-road fleet. The new units are International model DCOT-405 tractors rated at 76,800-lbs gross combination weight, equipped with 195-hp diesel engines.

Texas Oklahoma Express has added 15 International diesel-powered tractors, spending more than a quarter-million dollars, to pull 40-ft semi-trailers on long-distance runs. The new Model DCOT-405 heavy-duty highway tractors are equipped with 220-hp diesel engines.

27 International diesel-powered highway tractors have been added to the 128-truck fleet of Leased Trucks, Inc., as part of a fleet expansion and modernization program.

24 of the new trucks are the International model DCOT-405 tandem-axle tractors with 80-in. sleeper cabs, equipped with 195-hp engines, and the other three are compact-design model BC-225-DL tractors featuring lightweight construction, also equipped with 195-hp engines.

Both new models will pull refrigerated 40-ft semi-trailers delivering fresh meat, dairy and fruit products among other grocery items.

Aeroquip Is 20!

Aeroquip Corporation is celebrating their twentieth year serving industry. It's a remarkable growth for a remarkable company. Aeroquip was only a dream in the minds of 10 Jackson, Michigan businessmen 20 years ago . . . today this amazing company boasts 10 plants in US, Canada and Germany with world-wide distribution of its detachable and reusable fittings. DIESEL POWER wishes them a happy birthday . . . and many more to come!

(Continued on page 20)

morco®

Factory-Certified Exchange Crankshafts give Trouble-Free Operation for the Full Life Cycle of Your Diesel Engine

Morco dealers — coast to coast — are stocked with reconditioned, like-new crankshafts for different diesel engine models. Users of Detroit Diesel and Cummins engines can exchange worn shafts for MORCO factory-reconditioned shafts through authorized dealers.

Why take chances? Let your dealer be your source for dependable, safe crankshaft regrinding. You get immediate service, guaranteed quality and terrific economy. Ask your dealer about MORCO today.

Look what Morco's complete reconditioning service offers you!

Magnaflux—six separate magnaflux inspections with latest equipment.

Ground on production type equipment to engine manufacturer's specifications. Original stroke retained.

TOCCO* Induction Hardened by the original equipment method when necessary.

Rolled Fillets increase strength at the most critical areas.

Dynamic Balance restored on original factory balancing equipment.

Gear Fits renewed.

Key Ways restored.

Dowel Holes repaired.

Oil Seal surfaces renewed.

Threads repaired.

*TOCCO is a registered trademark of The Ohio Crankshaft Co.

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Please send free copy of "The MORCO Story":

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(Continued from page 19)

Diesel Units For Union Pacific Railroad

Union Pacific Railroad has announced the purchase of 30 Diesel-Electric Freight Locomotive units to be built by the Electro-Motive Division of General Motors Corp.

Scheduled for delivery during July and August of this year, the locomotives will cost more than $6-million. The units are rated at 2,000-hp each.

White Gets Huge Launch Site Order

Yes, it sure takes a lot of engines to power Atlas missile launching sites. And White Diesel Engine Division of the White Motor Company is all set to fill an order for 109 engines, valued at $4,500,000 placed by the Corps. of Engineers, Kansas City, Mo. It's the largest single engine order ever placed with the company's Diesel Division. Moreover, there's an option for 72 more to be filled at a future date.

These engines will drive 500-kw generators, furnishing prime power at Atlas missile launching sites throughout the US, probably setting a new record for maximum kilowatts in a single order. Info on the sites remains sketchy, but the power units will probably be housed in an underground structure suspended on hard-base earth . . . the building, probably 14 stories deep, and the engines ventilated by huge air intake and exhaust systems.

Engines purchased are White Superior 40-SX-8's with 9-1/8-in. bore and 10½-in. stroke, developing 715 bhp at 720-rpm.

Equipment listing for the engines includes General Electric generators and exciters, Elliott Turbochargers, Woodward load-sensing governors, and exhaust-heat-recovery silencers by Engineering Controls, Inc.

Also, Yates-American lube oil coolers and jacket water heat exchangers, Young intercoolers, Air Maze air filters, Commercial Fulflo lube oil filters, and vibration mounts by Fibration Mountings, Inc.

Minnesota-Wisconsin Gets Clark Compressors

Midwestern Gas Transmission Co. has purchased nine Model TLA compressors manufactured by Clark Bros. Co. The compressors, totalling 16,200-bhp, will be used for the new 24-in. natural gas pipeline running from the Canadian border across Minnesota down to central Wisconsin.

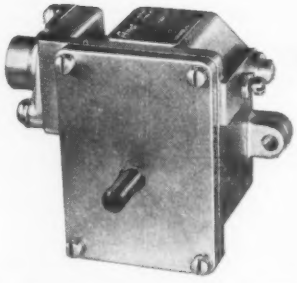
Construction of the new line, which will join with Trans-Canada Pipelines, Inc. at the northern end and with a Michigan-Wisconsin line in the south, is scheduled for early this year and for operation next Fall.

First Diesel Outboards Shipped

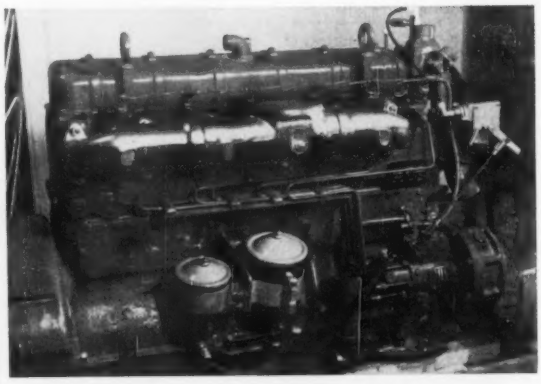
Shipments of the world's first diesel outboard motors at the rate of 10 a day was announced by American Marc, Inc., with a goal of 4000 a month assured by year's end.

(Continued on page 22)

NOW! **AMOT Model 2800** *Safety Trip*



Provides AMOT protection to smaller engines and industrial equipment



Model 2800 SAFETY TRIP with 2230 Temperature Valve installed on a Waukesha Diesel Engine, Model DKB, being crated for shipment.

HOW IT WORKS—The SAFETY TRIP is a snap acting mechanical control which trips on low oil pressure and closes a fuel or air valve to shut down the engine or return it to idle.

HOW IT'S MADE—The Model 2800 housing is a high strength aluminum alloy die casting, while the working parts are of precision cast steel. No stampings to bend or break. A manual stop button is standard on all controls.

FOR MORE INFORMATION ON THE MODEL 2800 write to

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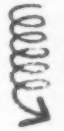
If it rolls on an axle or turns in a bearing or rides on a shaft if it slides in a groove or moves on a pivot if it bores  or cuts or transmits pressure

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600 Fifth Ave., N.Y. 20 N.Y.

Sinclair

(Continued from page 20)

Just a moment out for the photographer, please! Two of the principals in recent cut-and-fill terracing demonstration. Fred Tomlin (left), on whose 500-acre farm demonstration was held, and SCS's A. P. Crowell.

Construction Equipment Is MUST Item In Increased Conservation Program

Construction equipment will be more and more in demand as the conservation program becomes more wide-spread, under the guidance of the Soil Conservation Service.

In cooperation with Illinois Road Equipment Co., an Allis-Chalmers construction machinery dealer in Springfield, Ill., a demonstration of conservation earthmoving techniques was sponsored by Sangamon County's Soil Conservation District. It was another in a series of such programs across the Midwest to show the feasibility of cut and fill techniques in the construction of modern terrace systems. Demonstration was attended by farmers and soil conservation contractors in the area as well as by SCS men interested in gaining added knowledge of cut and fill terrace construction.

An Allis-Chalmers TS-160 motor scraper and HD-11 crawler tractor were instrumental in constructing a diversion terrace during the 3-day demonstration. The motor scraper was used to form a waterway leading to a farm pond while a FORTY FIVE motor grader graded a diversion terrace.

Consolidated Freightways Expands Fleet

$21-million will be spent on an equipment modernization program this year by Consolidated Freightways, with $4.4-million going into the purchase of 778 highway trailers, 77 diesel refrigeration units, 17 "converter dollies" (for assembling double-bottom combinations) and five heavy-duty highway tractors.

Consolidated is the biggest motor common carrier in the nation. The company recently acquired two additional carriers as a result of which its operations now extend coast-to-coast.

Working on the Railroad!

The famous locomotive isn't the end of the Diesel Story by a long shot! Railroading demands the entire gamut of diesel equipment as evidenced by the recent purchase of over a $1-million worth by the Union Pacific Railroad.

As part of its 1960 track and right-of-way maintenance program, officials report the order includes seven diesel road graders, two trucks equipped with telescopic hydraulic cranes, three front end loaders and one 18-ton wagon crane.

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- Quick action cover lifter
- 100 psi standard design pressure
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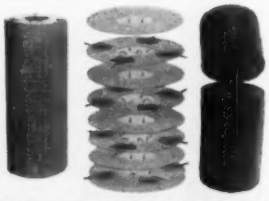

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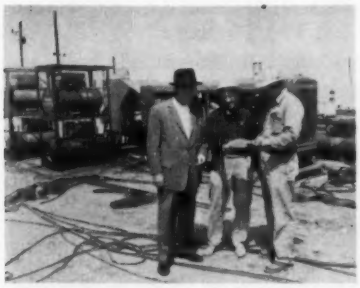


Cleon Gorbett of Gorbett Bros. Steel Company with Fort Worth City Water Department Inspector Leon Kornitsky and W. J. Goodfellow, Gorbett Job Superintendent. That's the circuit schematic they're looking over.

Diesels Do It . . . For BIGGEST in Texas!

Cat's D 337F is helping construct the largest capacity steel tank down in Texas. It's providing centralized power for a multiple-welder operation. Engineered and modified by Darr Equipment of Dallas, local Caterpillar Dealer, it's completely portable and can be unloaded, positioned and have 15 welders welding within an hour!

Greater efficiency and substantial savings in job set-up time as well as in power costs are being realized. Cat's custom-designed power panel unit has 15 300-amp outlets to accommodate this number of welding units simultaneously with individual control. Gorbett Bros. Steel Company of Fort Worth is using the 150-kw diesel electric set to power eight 300-amp welding machines . . . one electric cutting tool and a 30-hp air compressor in the construction of a 9.2-million gallon water "reservoir." Cat's set is completely enclosed in a specially designed louvred sheet metal housing. Fuel tank and power panel are mounted within the enclosure. Unit is completely self-contained and portable.

Policing That Vibration

Vibraswitch, a product of Robertshaw-Fulton's Aeronautical and Instrument Division, is the malfunction detector scheduled for installation at five pumping stations on the $150-thousand Transwestern pipeline.

ROUNDUP:

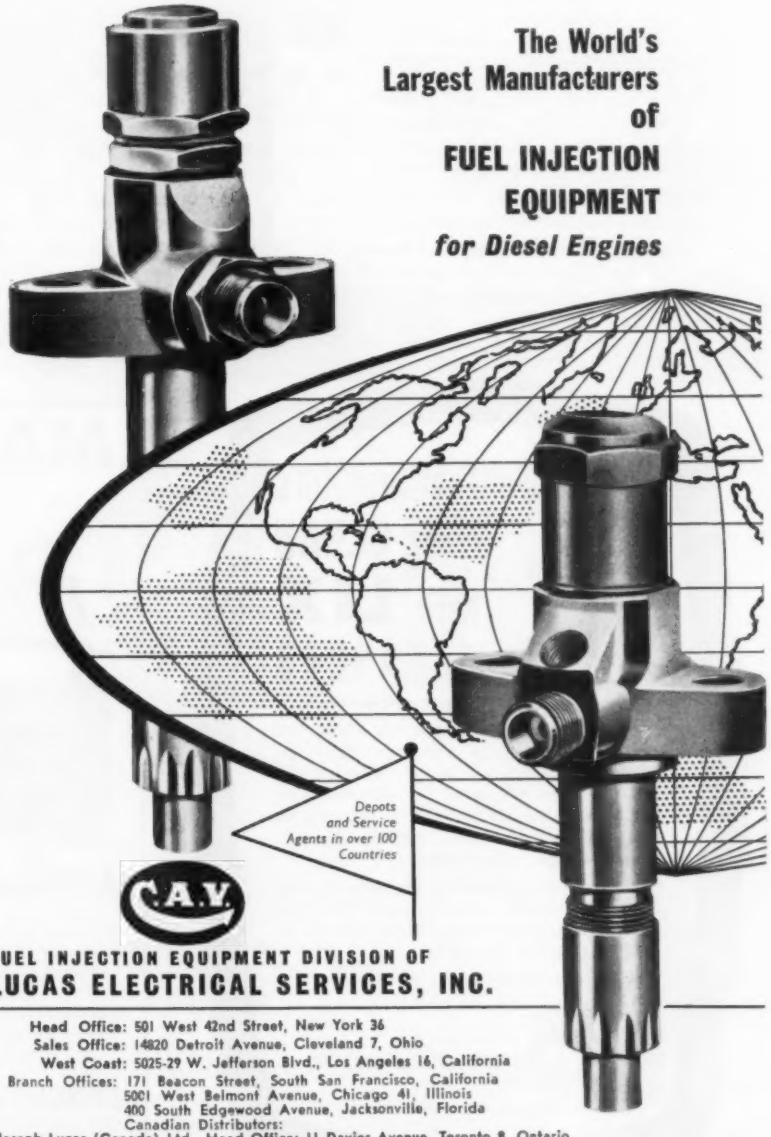
Proposed Pipeline Construction

• Transcontinental Gas Pipeline Corporation plans to build over 280-miles of new pipeline . . . and they'll be adding 32,040-hp to 12 existing compressor stations.

• Houston Texas Gas and Oil Corporation has plans for five new 4000-hp compressor stations . . . and 200-miles of new pipeline.

• Coastal Transmission Corporation hopes to build 80-miles of new pipeline plus two 55000-hp compressor station. Plans also call for adding an additional 1500-hp to existing compressor station.

• El Paso Natural Gas Company has plans in the works for a 440-hp compressor station . . . plus 100-miles of new pipeline.



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400 South Edgewood Avenue, Jacksonville, Florida
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Joseph Lucas (Canada) Ltd., Head Office: 11 Davies Avenue, Toronto 8, Ontario
Branch Office: 3401 St. Antoine Street, Montreal 30, Quebec

AP929

J. R. Scarborough

Scarborough Moves Up To Executive VP At Metalock

John R. Scarborough is back on the East Coast as Executive VP with **Metalock Repair Service, Inc.**, well-known Long Island City casting repair organization. Metalock is a practical method of casting reclamation by cold repair in the field. Scarborough started with Metalock as a repair man in 1941, working in California. In 1944 he opened Metalock's New York and Eastern Division. He's a vice president of the Golden Gate Mining Corporation and president of Interstate Oil Exploration Company.

R. W. Allen

Mack Truck Appointments

Robert W. Allen has been named Assistant General Sales Manager, **Mack Trucks,** representing Mack's vice president, general sales manager, **T. H. Jones,** in field operations, headquartered in the Plainfield, N. J. offices. Mr. Allen started out with the company in Detroit in 1926, and has since served as district manager in Houston, Philadelphia, and St. Louis, and also was National Used Truck Manager.

E. K. Christensen has been appointed assistant director of Mack's service division and **Robert Hamilton,** manager of service engineering.

C. J. Kremer, Jr.

R. W. Hoyt

C. Lee Cook Promotions

Charles J. Kremer, Jr. and **Richard W. Hoyt** have been named vice presidents of the **C. Lee Cook Co.,** piston ring and packing manufacturer and a division of the **Dover Corp.** Mr. Kremer will be in charge of Engineering and Mr. Hoyt will manage the Airtomic Products Division.

Fuel Injectors come CLEAN with LIX CLEANERS

No matter how dirty any part of your diesel engine may become, Lix Cleaners will remove oil, grease and burned-on carbon with speed and efficiency—saving valuable man-hours. All metals can be cleaned in the same tank at the same time, permitting more parts to be cleaned per dollar invested.

Lix Cleaners will satisfy your cleaning needs. For vital engine parts, electrical equipment, engine blocks or oil barge interiors, there is a Lix Cleaner that will DO IT BETTER and SAVE YOU MONEY.

Write for more information or a demonstration.

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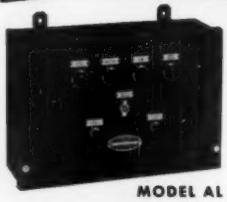
MADE FOR . . .
YOUR ENGINE'S
Protection



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Any abnormal condition existing in your engine can be immediately brought under control by the operator with the use of Synchro-Start . . . . . .

AUTOMATIC ENGINE CONTROLS

Your engine can be protected by being automatically shut down at the first sign of low oil pressure, high water temperature, overspeed, etc.

The AL series of Synchro-Start Controls is made to fit individual requirements. Your specifications sent to us will bring immediate response.

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KIENE® diesel engine test equipment

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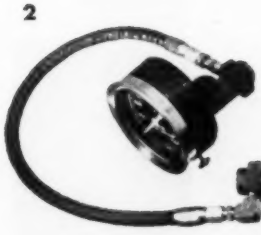

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Kiene Adapters and Connectors available for all makes and models of diesel engines manufactured in U.S.A.

1. **Model KTP-50, Hydraulic Test Pump . . . designed for field service . . . portable . . . no bolts or clamps for leverage . . . many novel features.**
2. **Model K-120, Universal Indicator . . . for high-speed automotive type diesels...can be adapted to larger engines for firing pressure readings.**
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5. **Model UTS-10, Portable, Universal Unit Injector Test Stand . . . checks all sizes in one fixture.**

Kiene Diesel Engine Test Instruments are recognized throughout the industry for their accuracy and adaptability. They are designed for long service under most severe field conditions. Kiene equipment assures the proper maintenance of diesel engines . . . helps prevent costly down time. Get the facts on Kiene before you invest in diesel test equipment.

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J. D. Olson

L. M. Donovan

New District Sales Manager for Rochester Manufacturing

John D. Olson, Jr., has been appointed district sales manager of the **Rochester Manufacturing Company** of Illinois, taking on the responsibility of the Midwestern promotion of R-M's new product program.

Lawrence M. Donovan takes on tractor gauge sales in the management realignment.

Eimco District Manager

Thomas J. McNeil has been named New York District Manager for the Eimco Tractor Division of the **Eimco Corp.** with a territory including the northeastern U. S.

Millward T. Thomas, 1875-1960

The recent death of **Millward T. Thomas**, founder and President of the **Thomas Flexible Coupling Co.**, has been announced.

Mr. Thomas, responsible for the invention and development of the Flexible Power Transmission Coupling, led his company to its position as the recognized leader in the field.

Richard H. Crook who has served as a director and personal advisor to Mr. Thomas, has been elected as successor to the late president. He will take over where Mr. Thomas left off, in the further development of the organization.

J. A. Wiendl

Sales Executive for Ingersoll-Rand

Joseph A. Wiendl was appointed general manager of sales for **Ingersoll-Rand Co.** Associated with the firm since 1941, Mr. Wiendl was assistant general manager of sales prior to his promotion.

Briggs Filtration Appointment

Walter E. Yedlinsky has been named representative for industrial sales in the western Pennsylvania area by the **Briggs Filtration Co.** Mr. Yedlinsky was a senior engineer concerned with the design of Nuclear power plants for the U. S. Navy at Westinghouse Electric, Atomic Power Division before joining the Briggs sales staff.

(*Continued on page 68*)

Today's Diesel Man...

W. B. (Bryce) Allingham, D-C dieselman.

Back in 1936 I saw my first truck diesel. It was a Cummins; I forget what make of truck. Hinges on the hood were practically worn out from opening it. Everyone was curious . . . wanted to know what it was, how it worked. I was right in there with the rest." This was how W. B. (Bryce) Allingham, superintendent of maintenance for Denver Chicago Trucking Company, described his first brush with diesels. They are no mystery to him now.

Bryce has a big job supervising maintenance on over 3000 vehicles, over 400 of them diesel-powered. Besides the coast-to-coast long-haul freight operation, there is also a tanker fleet and many shorter-haul trucks to be kept running. D-C's maintenance facilities by any standards are tremendous—the 52,000-sq ft Denver shop, for instance, works around-the-clock on a 7-day week basis keeping the trucks rolling.

So the job IS big. How do you work up to a job like this? Are the functions and interests different for a similar job in, say, a small fleet? These were questions to explore.

When the load is ready to go—the tractor has to be ready too! It's Bryce Allingham's job to see that it is.

Our maintenance program helps insure our goal of service and reliability to our customers. It is also an important factor in controlling our cost of operation. Programs take people and W. Bryce Allingham is a key man in helping us meet our overall goals.

William J. Blohm, V.P. of Highway Operations and Maintenance, Denver Chicago Trucking Company, Inc.

His Training Began From Ground Up . . .

Bryce started the same as a lot of men in similar jobs—by doing and learning. Trucking was much more informal in those days. He drove trucks, fixed tires, repaired engines. Back in 1938 with System Freight Service on the West Coast, he got into parts buying for the mechanics. He was also with Southwestern Freightways and Navajo, until 1952 when he started with Denver Chicago Trucking Company.

On the surface this is a familiar pattern. But some men make it to the top and some don't—so we have to look below the surface. Some clues can be found in Bryce Allingham's comments and attitude. For example, in discussing current projects aimed at increasing service life of components (electrical equipment, injectors, tires are some) he said, "We don't know it all. There's always room for improvement. Right now, we're trying to take advantage of the specialized knowledge of our suppliers. If anyone can tell us how to do something better, faster or at lower cost, we'll listen."

Another clue concerns training—he wants factory training for his men . . . even willing to pay for it. He'll pay the men while they're attending too. Here, a bow should go to his enlightened management as well.

And still another clue is found in his comments on how he keeps up-to-date on industry developments. He mentioned a local group of maintenance superintendents that met informally to exchange ideas. He found this extremely valuable and felt that this important pooling of experience could be made more beneficial by extension of the group idea into a national association serving the interests of maintenance people.

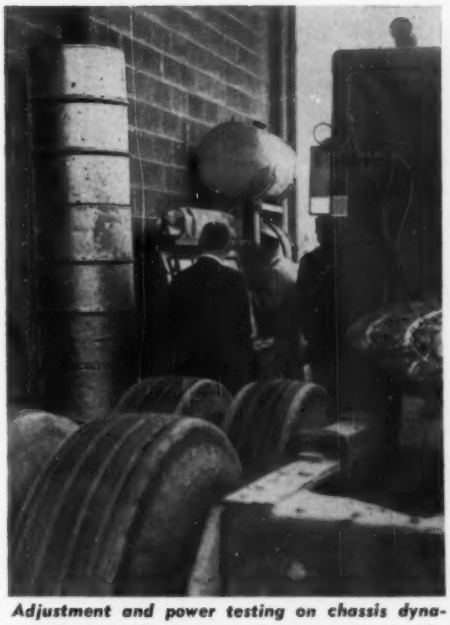
Trade magazines, including DIESEL POWER, were credited as a valuable source of information and ideas. "With things moving as fast as they are today", he said, "we need all possible sources of ideas if we're to keep up. If you close your mind and stop learning, you're on your way out."

Fundamentals Hold True Regardless of Size . . .

Interests and functions? Just about the same for any sized outfit according to Bryce. "After all, one truck has the same parts and problems as a hundred of them. It's just the numbers that increase. In a big operation you've got more 'hands' working for you and you're further removed from the actual work. Regardless, you have to stay right on top of what's going on, both the mechanical work and technical details.

"Administratively, the load is heavier", he stated, "but setting up a maintenance program is different only in its scope. You still have to set up the policies and procedures. Then, in either a small or large operation it is only a matter of seeing that it is carried out properly. In a big operation like this you have to delegate more of the responsibility. But, basically, I'm responsible . . . and I see to it that I am accurately informed at all times."

During the interview, the phone rang constantly and people kept coming in. All wanted answers or made reports. Proof that Bryce was really on top his job was evident from the fact that people got their answers,



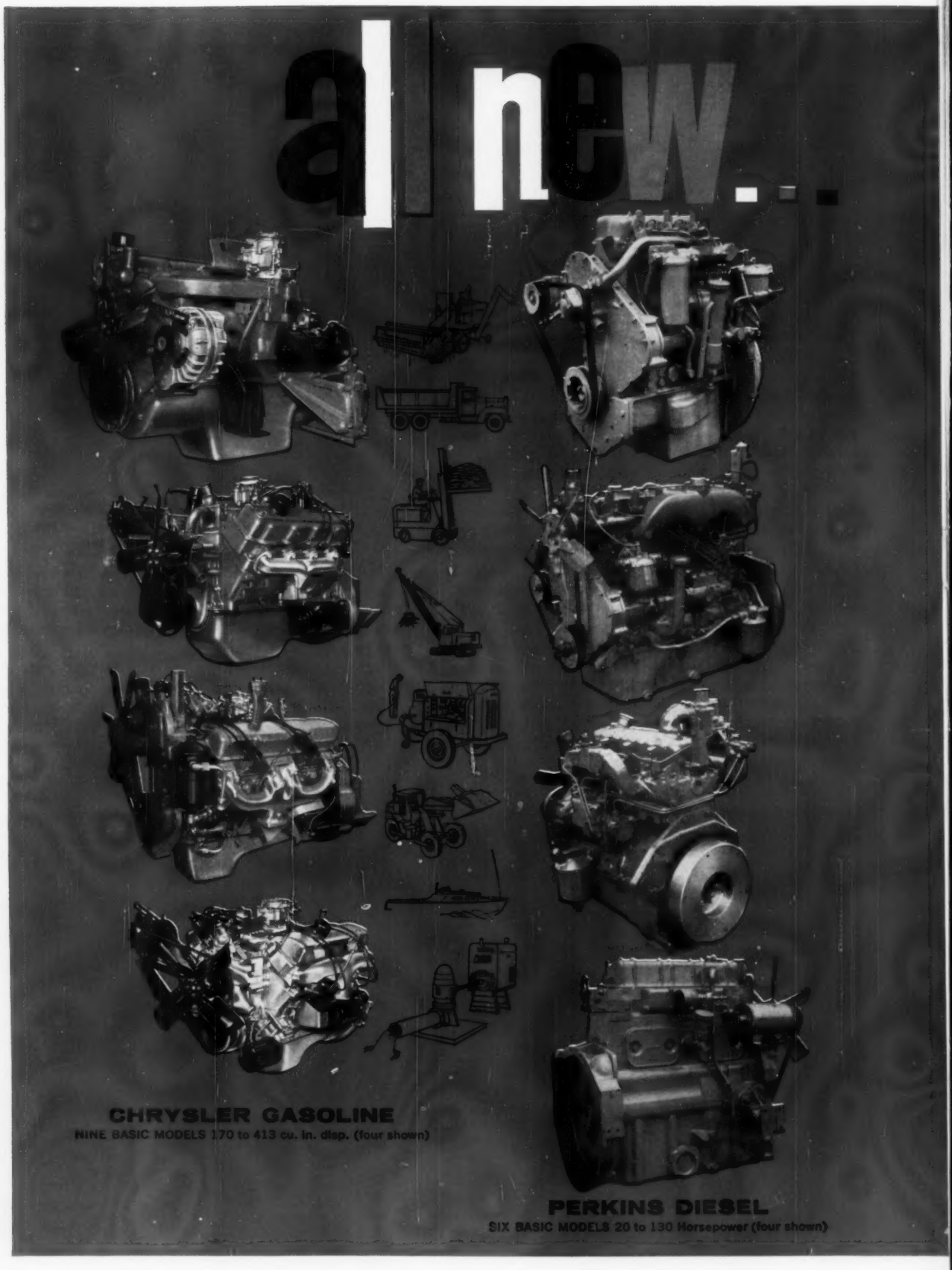
Adjustment and power testing on chassis dynamometer, results being read on console. Inside, engine dynamometer tests all rebuilt engines.

even on involved mechanical details, quickly and concisely. Reports received were assimilated and if further action was indicated, instructions were given. Yet in this beehive activity something else was evident—there was time for people.

Two examples . . . a driver came in to discuss the situation of another driver, forced to stop driving for reasons of health. Could Bryce do something for him? He could and did. Then . . . snow was falling outside

(*Continued on page 30*)

D-C's unit and engine rebuilding takes place here . . . maintenance offices (left) above parts room overlook whole shop.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CHRYSLER GASOLINE
NINE BASIC MODELS 170 to 413 cu. in. disp. (four shown)
PERKINS DIESEL
SIX BASIC MODELS 20 to 130 Horsepower (four shown)

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CHRYSLER

New line up of Chrysler M & I engines . . . with a new running mate: Perkins liquid cooled diesels. Both highly compatible, highly competitive power plants now available in the United States and Canada from a single source: Chrysler M & I. Parts and service for both—marine or industrial, gasoline or diesel—available within 8 hours from Chrysler's nationwide Engine Center network.

What's new? The power, the package, the price! New Chrysler M & I line includes nine basic models—170 to 413 cu. inch displacement, two OHV sixes, seven OHV V-8's. Most are available in two versions—a heavy duty standard and a heavy duty premium—to give your application the exact power it needs. All are highly competitive engines that give you more heavy duty horsepower per dollar.

Perkins diesels are highly compatible with Chrysler's horsepower range—and just as competitive. Six basic models—three, four and six cylinders—20 to 130 horsepower. All high speed, liquid cooled engines with a proven record of performance in over 500 applications—including Chrysler built trucks and taxis.

If your power requirements are within the 170 to 413 cu. inch range, you'll want to take a good long look at the new power package from Chrysler M & I. *Send Coupon for Details.*

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Send for detailed information on new gasoline and diesel engines from Chrysler M & I

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Please send me the following literature: ☐ Perkins Diesel Full Line Specification Folders ☐ Chrysler M & I Engine Specification Folder

I am interested in an engine of about _____ (Horsepower) for _____ (Application)

NAME _____

TITLE OR DEPT. _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Today's Diesel Man . . .

(Continued from page 27)

and temperatures dropping fast. The shop's heating system couldn't cope with the change, particularly with the big doors opening and closing as trucks entered and left the service lanes. Space heaters were ordered—not only ordered, but the order followed up to get the units in that day!

"We've got good men and we want to hold them," Bryce told us. "I've worked in their spot and know how I would like to be treated. Taking care of them helps develop teamwork—and, in any sized outfit, teamwork is the payoff. One thing we have encouraged is good driver-mechanic relationships. You'd be surprised what cooperation here will do for maintenance. Knowing each other's problems, they listen to each other. Troubles are caught early and fixed promptly."

Bryce heads up a $6-million-a-year maintenance operation . . . complete records help him spot trouble before it begins.

Now, for a Look at the Shop . . .

Looking out of the centralized and elevated maintenance office, it was possible to see practically all D-C's Denver shop—the service lines, in-chassis repair area, rebuilding area for components including engines, dynamometer room, tire section, space for trailer repair . . . the works. Shop details are a story in itself but Bryce had the following to say on general maintenance policies.

"This is the main shop with one branch on the West Coast and another in Chicago. Policy and procedures are set from here. The way that D-C operates, when trailers are loaded and ready to go a tractor is dispatched *and it goes*. The maintenance department can't hold a tractor, so the program is geared to see that there are enough tractors ready to meet all schedules. Procedures —from washing and trip servicing to our mileage-based inspection and service programs have been set up so that the tractors are ready when they need them.

"Test and evaluation projects on new components and parts—and we always have some going—must be worked around the scheduled maintenance so as not to interfere.

"We're big enough and our work load is steady enough to justify complete facilities. This gives us maximum control of how things are done . . . also what should be done and when. You can learn a lot about what's going on when you take, say, a transmission apart at the end of so many thousand miles. Yet some things we don't do . . . it gets back to not being able to know everything. We farm out specialized work—injection equipment for instance.

"Also, although we have a complete engine rebuilding setup, we sometimes have engines rebuilt for us. We still have good control, however. The engines go through the dynamometer room. We also use a chassis dynamometer to check out complete tractor operation.

"The factor of control is important and helps justify going into all phases of maintenance but you must also weigh the skills, work load and costs involved. A good example is in our transmission and differential repair. We have centralized all this work for the system here. Considering the skills required, tooling cost and percentage of its use and the total amount of work, it works out better to do it all here. In another case or in a smaller operation, it might be more economic to farm out this work."

Records—Key to Effective Maintenance . . .

Equipment records are kept in the shop's office area, adjacent to Bryce's office. D-C's record system tells the whole operating story—performance, failures, repairs and parts used—each keyed to individual pieces of equipment and their mileages. Analysis of this information tells many things from parts usage for inventory control to what equipment and parts are standing up or failing. It alerts Bryce to trouble spots so he can take corrective action early. He can evaluate products on their actual performance and specify those that do the best job at the lowest overall costs.

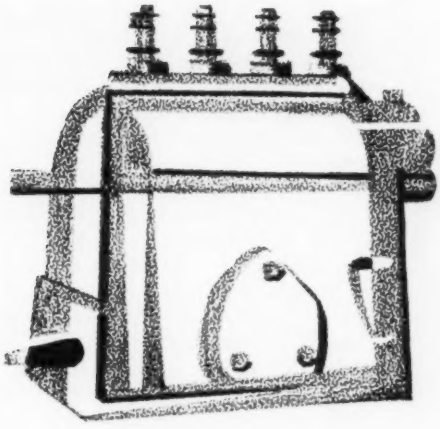
A section is also devoted to inventory control of the parts and supplies needed to keep the trucks rolling. Maintenance is a $6-million plus operation per year . . . better than $1-million in tires alone. Who buys? The purchasing department. Who tells them what to buy? The man in the best position to know what's doing the best job—Bryce.

A teletype machine in the inventory control section is connected to the purchasing department. With exception of some minor items, the shops' requirements are specified by quantity, maker and part number.

Looking Ahead . . .

Since D-C has a mixed fleet, Bryce was asked about what they thought of their diesels. He said that he had been instrumental in getting diesels into their long-haul service. D-C had a few when he came to work for them, the first going into service in 1950. By 1959, though, all their long-haul service was diesel. "We're just getting 50 new diesel tractors," Bryce told us. "Also, we're giving serious consideration to putting diesels into our localized operation that is presently gasoline engine-powered.

"I've come a long way and so have truck diesels since the time I saw my first in 1936. Now the only mystery about diesels to me is how we got along without them in long-haul trucking for so long."



Field Pump Calibration- How Good?

Modern, high-output engines depend on correct, balanced fuel injection for top performance. Are they getting it after field calibration?

Performance of fuel injection, rebuilt and recalibrated in the field, can be equal to that of new equipment . . . can be and often is. Some might argue the point on the basis of their experience, so there must be another side. There is . . . and there are a good many factors involved. The purpose here is to explore some of these and lay a ground work for better understanding of what the whole business of field rebuilding and calibration is all about.

There are three major areas for discussion: (1) technical aspects; (2) business considerations; and (3) owner influences. Let's get right to it.

Technical Aspects

Calibration of fuel injection pumps, new or rebuilt, means only one thing—insuring that the pump will deliver an exact and equal amount of fuel to each cylinder at the right time. It must do this throughout its range from idle quantities to maximum fuel. For some time, engine builders felt that this calibration could only be done accurately on the engine when running on a dynamometer. Setting were made so that the engine produced the required horsepower.

While there are some remnants of this thinking left, this method of calibration is dying out for two excellent reasons: (1) it was found to be less accurate than "direct" calibration of the pump off the engine; and (2) it is impractical for field calibration. Not everyone has a dynamometer and who wants to pull an engine from a tractor frame or truck chassis just to check out the fuel injection equipment.

So we are concerned only with direct calibration . . . matching pump performance to test specifications on a calibration stand. Sounds simple, doesn't it? It isn't. In fact, it is only recently that any real progress has been made toward establishment of standards to eliminate the long list of possible variables.

All engine manufacturers have developed test specifications for their engines. Fine, but these are not necessarily referred to a common "yardstick" that applies to other pump types and makes. Theoretically then, every shop doing pump work would have to duplicate the exact setup that each manufacturer used to develop his specifications if calibration was to be exact.

This is not practical or economically feasible. Ideally, and the trend is in this direction, test procedures and equipment should meet general standards and each manufacturer should correlate his specifications to these standards. Agreement on certain key points would do a lot to eliminate many troublesome variables.

What variables . . .

Most specifications tell what fuel delivery should be at two widely separated points in the pump's operating range . . . quantity in cc's delivered for a given number of pump strokes at given rpm's.

Let's start with a simple variable. Suppose that the calibration stand's tachometer is badly off. An error is introduced, its' seriousness being determined by how far off the tachometer is. However, the shop can control this by keeping the test stand in good shape with periodic instrument calibration.

Some other variables affecting delivery quantity are not so easy to control. A few of the more important ones involve: Viscosity of test oil as a function of temperature; size, length and shape of high pressure lines; and type, setting and condition of the test nozzles used. If all these must be changed from specification to specification, it runs into considerable complication and a lot of hardware. Fortunately, a degree of standardization has been made possible.

SAE's Fuel Injection Equipment Subcommittee re-

cently made a progress report detailing some areas of agreement. Its members, representing builders of both engines and fuel injection equipment, reported the following tentative values:

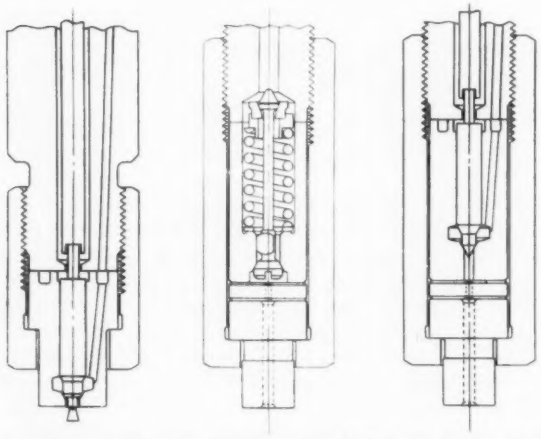
Test Fluid Temperature, °F.	110-115
Test Fluid Viscosity, SSU at 100°F.	45
Nozzle Opening Pressure, psi	2500 ± 25

ID's and Color Coding, High-Pressure Lines

0.062	0.082	0.093	0.125
black	light blue	yellow	red

Test line lengths are to be specified by manufacturers and SAE Specification on minimum bend radii are to be followed.

Three nozzle types (illustrated) are being considered for use as standard test nozzle.



Candidates for office of "Master Nozzle." How do you vote?

This may not sound like a big deal but it really is . . . it's important in itself as a basis for controlling many variables and also as an indication of the growing awareness of need for standards and willingness to do something about it. The Association of Diesel Specialists, having within its membership the finest fuel injection service shops in the country, cooperated with the SAE in arriving at this preliminary stage of agreement.

This Association has gone even further. Its committees are working on standardization of procedures, testing of calibration equipment and correlation of field experience. For example, they have initiated a test program to permit members to check general calibration stand performance and specifically test the "standard" nozzles used.

In view of these fairly recent developments the question arises, "How good has field calibration been in the past?" Surprisingly good . . . despite the difficulties. Men running these service shops are ingenious and have worked out techniques to do the job. It is significant that through the ADS and industry contacts they are in the forefront of the push for more standardication.

Enter business considerations . . .

Good equipment, original parts, skilled men and time are the ingredients for a quality, fully-warranted job. They also represent cost items that go into its price. Today's competition insures that pricing on "what the traffic will bear" is a shortcut to business failure. Then it's a fair assumption that each job can be given a certain legitimate price tag.

Yet no matter how close you shave this price, someone in the area will do it for less. How? Some obvious answers are: (1) "make-do" or inadequate equipment (lower investment, lower amortization costs); or (2) cheaper parts; or (3) lower-cost, less-skilled help; or (4) cutting corners on the job. Yet some customers buy on "price" until sometime later when their "bargain" turns expensive.

In the meantime, the ethical shop—with franchises from fuel injection equipment builders, heavy investments in tools, parts, buildings, etc.—is over a barrel. What does he do?

A good question . . . and he gets little help in working out an answer. If he bends toward lowering job standards he jeopardizes his reputation and inevitably feels the wrath of the engine builders and fuel injection equipment manufacturers. If he uses cheaper "will-fit" parts he's doubly damned. Yet if he holds to the highest standards of ethics he can be priced out of business.

Net result is that business considerations affect the quality of field calibration as much—if not more—than technical considerations. There's no easy solution but if engine owners would only realize that you get what you pay for and act accordingly, they'd be getting better field calibration. And nothing is more expensive in the long run than a cheap job.

Owner influences . . .

Ideally, every time a fuel injection pump comes in for repairs it should be put back in "as new" condition, capable of going through another full life cycle. Practically, it's a different story. Stand at the receiving counter of a fuel injection repair shop, listen to customer comments and you'll see why.

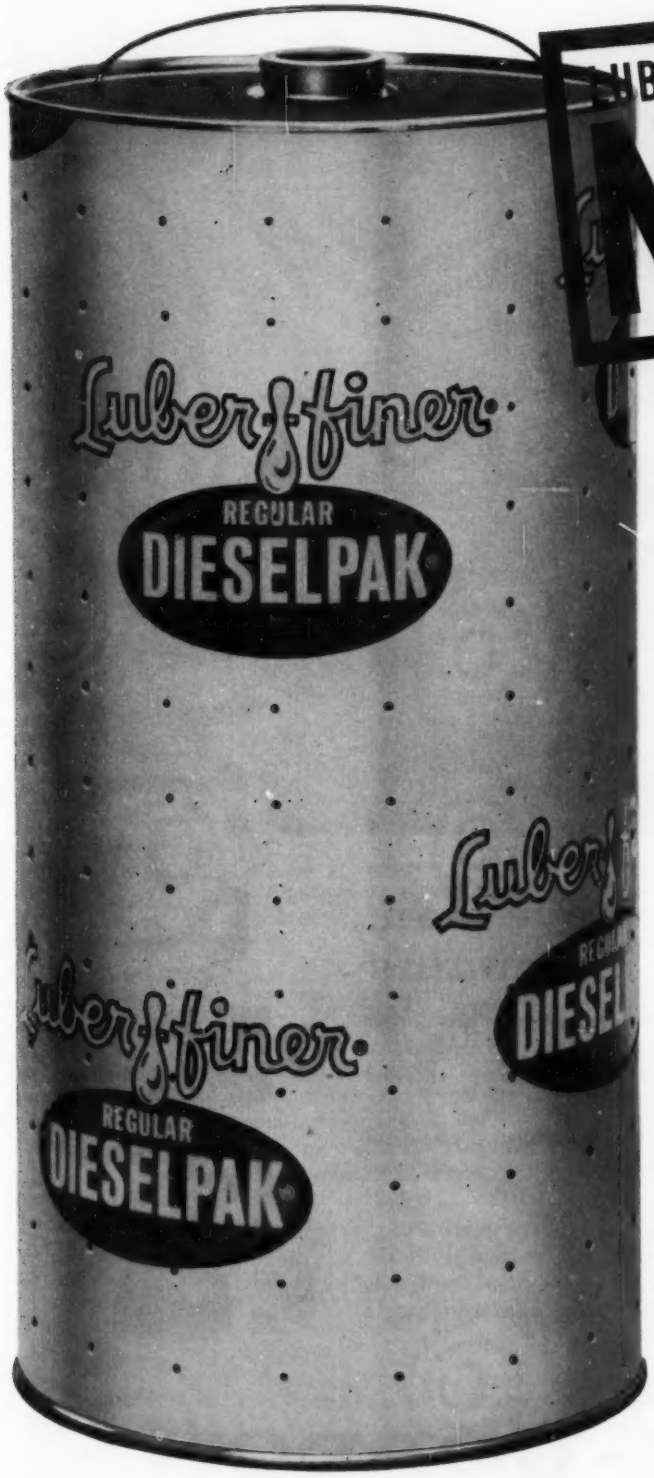
Typical comments: "Just get it running. I'm finishing up a job and when it's done, I'll trade the equipment." Or "I've got the engine down and just wanted to see if the pump was okay." Or "Check it out, let me know the cost. I'll see whether I can afford it." Or (occasionally, perhaps) "It's run 5000 hours; do whatever is necessary to give me the same service life."

Here's a range of customer requests for jobs ranging from a calibration check, through a patch-up job to a complete rebuild. Every customer has a right to specify what he wants done to his equipment but on the flip-side of "rights" is "responsibilities." One responsibility is to face the facts.

If the customer, no matter how legitimate his reasons, asks for something less than the best, he'll get it. But he should realize that such jobs cannot carry full warranty nor should they reflect on quality of the specific job or on that of field calibration in general.

Today's shops are capable of fine work and if they

(Continued on page 58)



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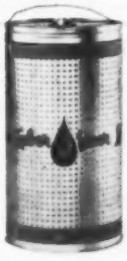

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"How to get MORE MILES of effective lubrication at LESS COST." Dept. D-12.

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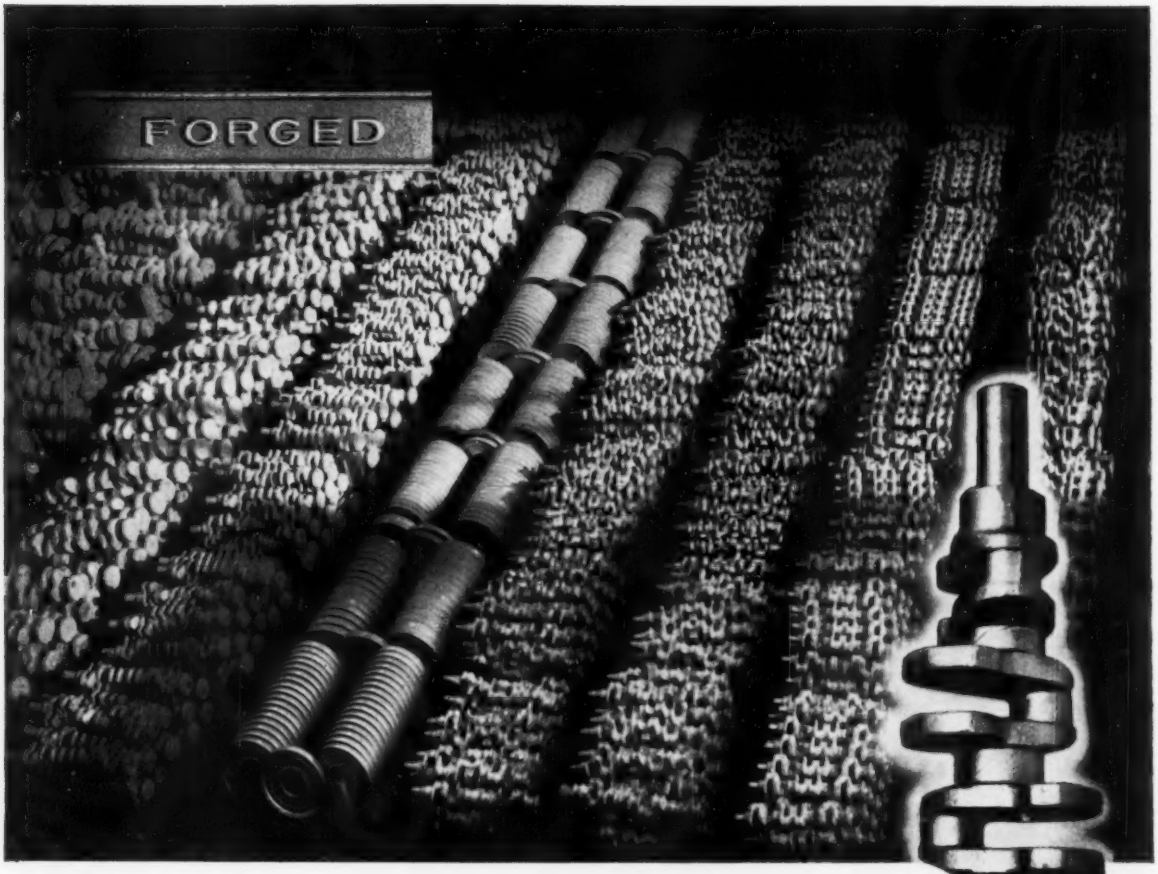
* **LOOK FOR THESE NAMES ON THE PACK—Your guarantee** that you get the money saving protection only GENUINE Luber-finer gives. Only Luber-finer **Dieselpak**—with its exclusive patented filtering process—removes oil contaminants effectively **far longer than any substitute pack!**

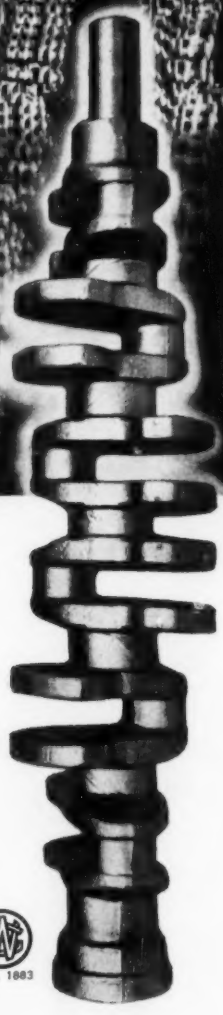


On their way to move men, merchandise—or mountains

For a nation on wheels and on the wing—a production run of forged crankshafts and jet engine compressor wheels for the builders of power-plants for pleasure cars, trucks, earth-moving equipment, and aircraft.

In missile development, too, Wyman-Gordon has proved the value of forging in achieving the highest strength-weight ratios, at elevated temperatures.

With forging experience dating prior to the birth of the internal combustion engine; with the greatest hammer and press capacity in the country; with unexcelled laboratory facilities; Wyman-Gordon is anxious to serve you at the design, engineering and purchasing stages of your developments.



EST. 1883

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FORGINGS

of Aluminum Magnesium Steel Titanium . . . and Beryllium Molybdenum Columbium and other uncommon materials

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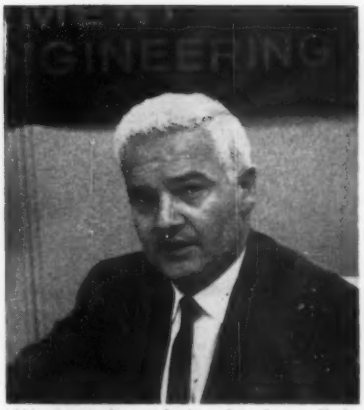
GRAFTON MASSACHUSETTS — LOS ANGELES CALIFORNIA — PALO ALTO CALIFORNIA — FORT WORTH TEXAS

Chrysler Takes On Perkins Line

"Our Division's product line is greatly strengthened by adding Perkins diesels."
W. L. Pringle, President



"Marine-industrial diesel sales will be augmented by active automotive program."
W. F. Humphrey, Dir. of Sales

Chrysler Marine and Industrial Division will sell and service Perkins diesels in USA and Canada.

Chrysler's Marine and Industrial Division is now in the diesel business with both feet. They've gotten the feel of it at various times but now they feel that they have a solid product and are in it to stay. The engine? The whole Perkins line. Territory? USA and Canada. Types of accounts? Just about everything including handling current Perkins OEM accounts (in some cases mutual agreement is required) here and in Canada.

The M & I Division gets a proven product in volume production high enough to make prices very attractive, even after import. Perkins gets a solid, well-established engine sales and service organization already in being, something that they've lacked on a national scale in this part of the world.

W. L. Pringle, president of M & I and a veteran in the engine field, said that the scope of the agreement with Perkins and the overall marketing concept not only strengthened the position of their "engine centers", giving them an expanded line with the diesels, but opened up a marketing scope far beyond the concept of normal marine and industrial sales.

W. F. Humphrey, director of sales, elaborated on this idea. Light vehicular applications from tractors, through construction equipment to trucks will be a major target. Perkins has done a lot of such applicational work abroad, some with Chrysler foreign divisions, and all this experience, plus work Perkins has done here, will accrue to the M & I Division. Out of these previous Perkins activities arise one of the few exclusions in the contract agreement.

Due to work done previously with certain large truck manufacturers, Perkins will continue to work directly with them. In other cases M & I Division will be the supplier to current Perkins OEM accounts and back up the engines (including warranty) with their sales and service organization.

In the sales program, headquarter's prime target will be on the larger original equipment manufacturers. Engine Centers and their dealers will be encouraged to solicit OEM business from smaller, more localized manufacturers. It is not intended that any complete end-products will be produced at Detroit. However, the distribution organization will be backed up by applicational engineering advice and aided, particularly in their repowering jobs, through availability of completely engineered kits.

Chrysler's M & I Division currently has some 50 "engine centers", with about 106 dealers at the next level and then about 104 authorized service stations set up for everything to include rebuilding. Plans call for expansion of engine centers to the 75-80 level with the others growing in rough proportion. Preliminary concentration as far as diesels go will be to get the engine centers handling sales and service first.

Training is a big part of this program. Perkins personnel with visual aids, cutaways and all the rest will conduct week-long schools at key cities starting July 11th. The order runs—Detroit, Chicago, Atlanta, Rye (New York) and Los Angeles. These will be run at the Chrysler Training Centers and will be open to Chrysler personnel and that of the distributor organization. Training will feature "application" as well as "service".

Things are moving fast at Detroit. The first batch of engines and parts is ready at Perkins' Peterborough, England plant. Many are already on order by M & I distributors throughout the country. The contract agreement is so new that there are a lot of details to be worked out and key people in Detroit are really working on them. J. P. Allan of F. Perkins (Canada) Ltd., who represented Perkins in the agreement, is setting up an office in Detroit to work with the Chrysler people in addition to their other accounts.

Chrysler expects to sell a lot of engines. They are enthusiastic about the product they have to offer, feel that they have a sound, workable merchandising program and have seen to it that they have the right people to push it. In normal marine and industrial sales they could well expect success but adding the potential of automotive sales (remember this is Chrysler), they could have something really good going for them.

S. E. Miller, American Bosch's Vice President and Division Manager.

AMERICAN BOSCH'S ELECTRONIC BRAIN

IBM's RAMAC 305 plans production schedules . . . determines inventories, issues purchasing requisitions and fabrication orders! All adds up to better part availability . . . better customer service.

Last month American Bosch received a hurry-up order for a 1000 fuel injection pumps. How soon could they deliver? How many components were already on hand? How many components had to be produced, how many components had to be purchased to meet requirements? When should the various departments begin their production flow so as to dovetail into the final product?

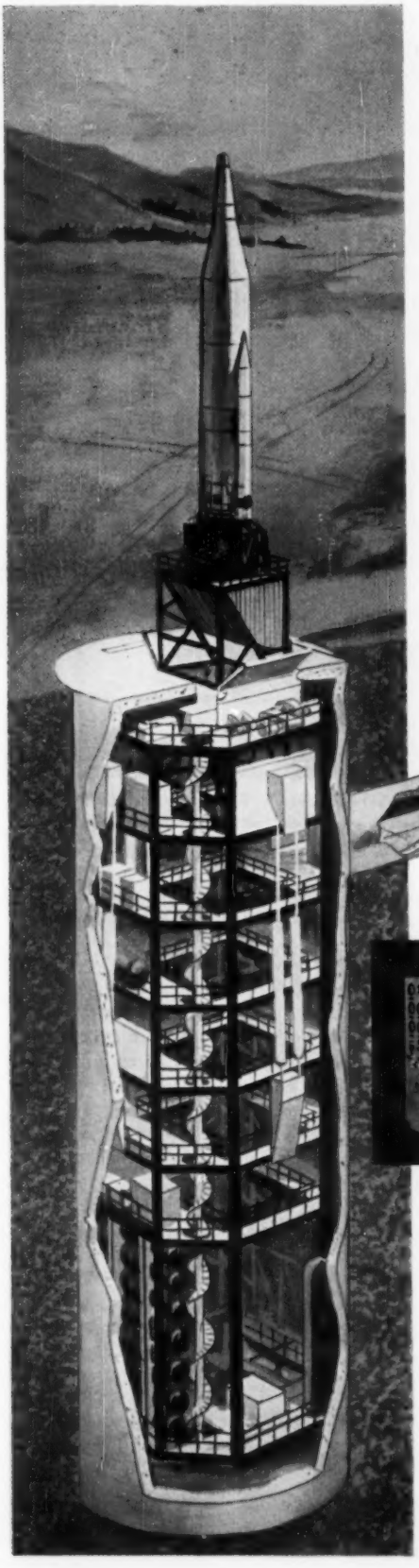
To obtain the answers, an American Bosch employee walked up to their new IBM RAMAC 305, slipping a single punched card into the sleek new "electronic brain."

In a matter of minutes he knew the inventory status of all the materials involved. What's more, the "brain" automatically began preparing purchase requisitions to meet requirements . . . began issuing shop fabrication orders that would insure the coordinating of all production schedules to meet their deadline.

First the computer searched out the various inventory levels, computing the quantity of each component needed to meet production requirements for the 1000 pump order. Then, the "brain" told him how many assemblies were available, how many he would need to make and how long it would take to make them . . . when they should be scheduled for production to meet the order deadline. The computer also decided if it would be more economical to put, for example, 5000 assemblies into production instead of only 1000.

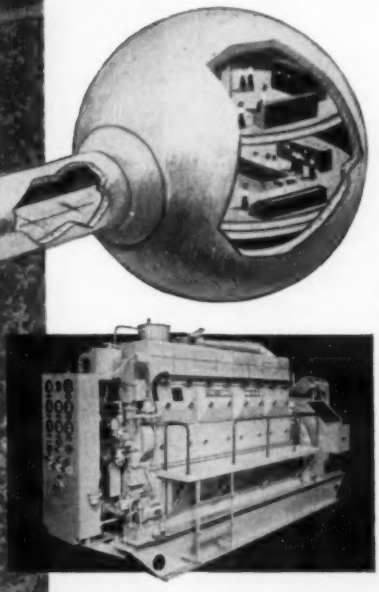
How much money is the "electronic brain" system saving them?

"It costs American Bosch $30.00 for each purchase order we write—*just to prepare them*," explains S. E. Miller, vice president and division manager. "Since we switched over to IBM Management Operating System our shop orders alone have been slashed by 4000! Furthermore, we anticipate this $120,000 saving in production costs will be more than tripled in the near future. It all adds up to better part availability . . . better service for our customers."



WHITE SUPERIOR ENGINES selected for ATLAS launching sites!

At USAF Atlas launching sites throughout the United States, prime and standby power will be supplied by White Superior engines! The Army Corps of Engineers, Kansas City, Missouri, has purchased 149 eight-cylinder supercharged Model 40 Superiors, each driving a 500 KW generator. These engine-generator sets will produce precise frequency for operation of computers and other electronic equipment. Six of the 13 planned Atlas ICBM squadrons will feature underground silo-type launching sites. Here an additional task for the Superiors will be powering elevator machinery to lift the 120-ton ICBM's to ground level, after they have been fueled and checked out down under.



White Diesel

Superior ENGINES ATLAS Imperial DIESEL ENGINES White DIESEL

WHITE DIESEL ENGINE DIVISION
THE WHITE MOTOR COMPANY
Plant and General Offices: Springfield, Ohio

The contract for 149 Superiors highlights a growing and impressive list of Superior-powered U.S. defense installations. Included are the "Texas Towers," portions of "DEW" line and "SAGE" project, Eglin Gulf Test Range and other missile tracking ranges, and numerous launching sites for other types of missiles. Acceptance of Superior engines for these assignments is convincing evidence of their rugged dependability, trouble-free performance and economical fuel consumption. Superior engines—215 to 2150 HP or 150 to 1500 KW—will also meet your exact power requirements, including automatic, unattended or remote controlled operation. Write for complete information today!

USAF artist's conception of Atlas underground silo for launching missiles

Tool Closeup:

Looking At Line Boring

Accurate line boring is a *must* when rebuilding today's engines—but when selecting your equipment it makes good sense to consider not only accuracy but productivity and *then* the price.

By ***A. W. Larson***
Vice President & General Manager
Tobin-Arp Manufacturing Company

Vertical-horizontally adjustable parallels assure perfect alignment for centering operation.

If a mason bought himself a cheap level that never read quite true and took twice the time to level his bricks, we'd call it false economy no matter what the level's price. Exactly the same is true of line-boring equipment, so necessary to obtain straight, round, aligned bores for main and camshaft bearings in modern engines.

There can be no compromise with accuracy or why bother at all? Then comes consideration of how many man-hours are involved in getting the required job. Finally, price can be considered—but only when correlated with accuracy and productivity.

Job precision depends on the inherent accuracy of the machine tool used or in some cases on the extent of ingenuity and skill applied to compensate for inaccuracies inherent in the design. The latter means more man-hours . . . less productivity.

Many line-boring machines, some of foreign manufacture and with attractive price tags, are being offered to the American market. Their design is, or is based on, the concept of a long bar for alignment accuracy and a large-diameter bar for rigidity. Yet significantly, "sag charts" are often provided to permit compensation even with the large-diameter bars, the weight of some requiring two men for handling.

Back in 1936, Tobin-Arp Manufacturing Company set out to prove that it was a mis-conception that a large-diameter bar was necessary to prevent tool vibration and chatter. Also, that a long bar was the only way to get accurate bearing alignment. They did this with their first model, TA 14.

Evolution of line boring . . .

Since manufacture of internal combustion engines began, the problem of replacing main bearings and camshaft bearings has existed for service organizations who rebuild engines. The greatest problem was, of course, getting good bearing alignment.

First of all, individual bearing surfaces in a crankcase had to be in perfect alignment with each other; next, there had to be alignment between camshaft and main bearings. These two lines had to be parallel within very close tolerances. Further more, these two lines must be square with the centerline of the engine cylinders.

In the early days of "motor overhauling," as it was then called, the mechanic unfortunately had nothing but relatively crude tools. These consisted generally of homemade molds for pouring babbitt, a tube of Prussian blue, and hand scrapers for shaping and scraping the bearings.

One main item he had to have, of course, was the 2-lb hammer which he used to try to free up the crankshaft in the bearings before the final running-in process. The industry was able to get away with these practices because engine output was low and the engines themselves not very critical.

Around World War I, some enterprising mechanics devised for themselves crude types of line-boring jigs which could be fastened to the pan-rail of a crankcase to accomplish this difficult operation. This was the beginning of the boring method. In the days of low-speed, low-compression engines, this method was more or less successful, depending largely on the mechanics' skill.

Need for better equipment . . .

By the end of the 1920's, there either were, or had been, ten or twelve different commercial line-boring jigs offered to the engine rebuilders, but as engine manufacturers gradually increased speed and the compression of their products, more and more problems began to arise in the bearing service field.

Equipment then available and used in almost every instance was a long boring bar, mounted in a series of bearings held in position on bridges which spanned from one crankcase pan rail to the other. The centering operation was accomplished by the use of a collet placed in each end bearing of the crankcase. These collets had a center hole of bar diameter size plus slight clearance. Collets had to be supplied in all different OD's to accommodate different bearing bores. These long boring bars had a multiplicity of cutter holes plus additional lock screw holes. Therefore, it was practically impossible to avoid a great deal of distortion, resulting in a sag of the bar between the two collets.

Result was that regardless of how skillful the mechanic might be, you could never be sure of perfect bearing alignment. The 2-lb hammer for freeing up the shaft in the newly-bored bearing was still with us.

Licking the sag . . .

Then in 1936, the Tobin-Arp Manufacturing Company tackled the problem of sag in a long boring bar, putting their engineering department to work to find a solution. The result was a new concept and the first completely engineered line boring machine offered to the engine rebuilding industry.

Alignment accuracy was *built into the top casting* of the machine. It's vee-type way provides alignment in the same manner that a lathe's ways insure tailstock alignment regardless of position. Support arms are adjusted horizontally and vertically as needed for a particular block and so that their bar bearings are on the same centerline. Once set, they can be swung up for clearance and moved along the top casting so as to provide bar support close to the work. Regardless of lateral position, their bar bearings always return to the same centerline.

Tobin-Arp used an 18-in. steel bar with one cutter hole and the cutter lock applied through the end of the bar. This eliminated one of the holes that could contribute to distortion and deflection. Diameter of this new Tobin-Arp boring bar was 1⅛-in., it was hardened to 63 Rockwell C scale.

With this short, hard bar supported between two adjustable arms mounted on this rigid top casting, it was possible to provide bar support close to each side of the bearing or saddle to be bored.

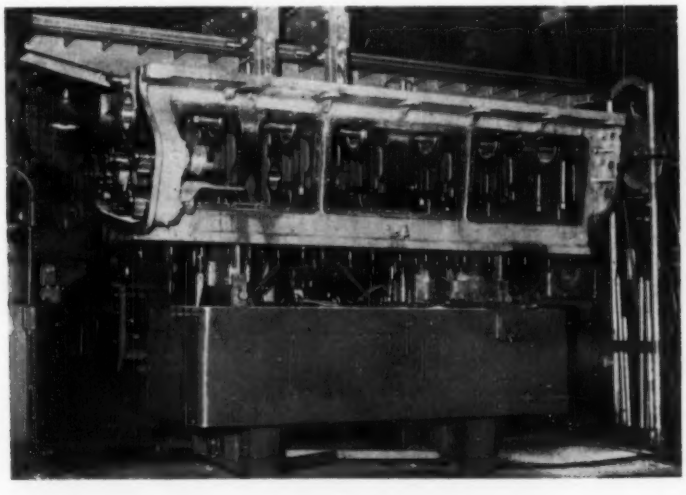
Results with this machine eliminated, first of all, the 2-lb hammer. And even on engines with as little as 0.001-in. clearance, crankshafts with a 3-in. dia main bearing would spin freely! This was truly something new and needed in the automotive engine rebuilding industry.

More accurate centering needed . . .

At the end of World War II, came the advent of the precision-type bearing with its thin, pre-finished bearing material. This, of course, created a new problem in bearing line boring in that now the engine rebuilder had to bore the saddles instead of the bearing surface. This necessitated far more accurate centering.

To meet this new need, Tobin-Arp developed special dial indicators and incorporated fine screw adjustments on the parallels for supporting and locating the engine block. With these refinements, the mechanic could perfectly center the bearing saddles to the boring bar's

(*Continued on page 71*)

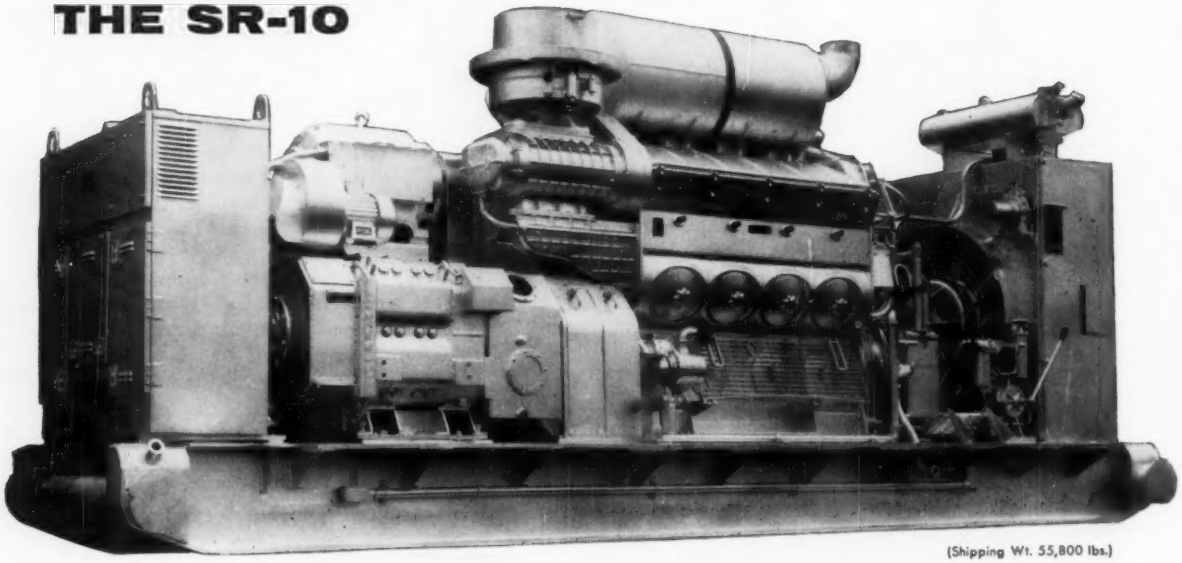


Secret of Tobin-Arp's accuracy is rigid overhead vee-type way— it's eliminated boring bar sag bugaboo!

ELECTRO-MOTIVE

—*for deep drilling*

THE SR-10

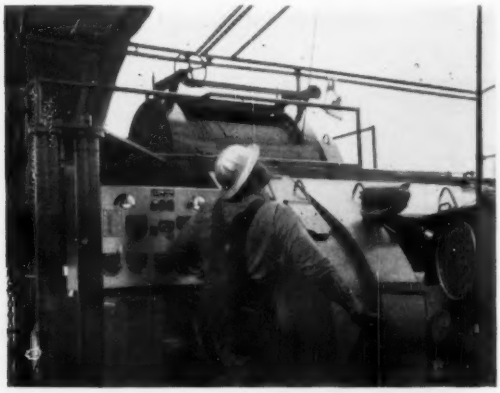


(Shipping Wt. 55,800 lbs.)

The standard of Diesel-electric power

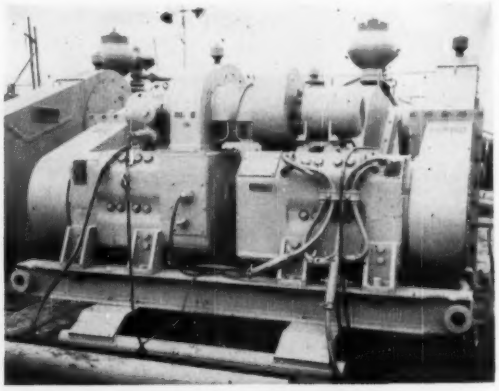
Electro-Motive power has been picked for more deep well applications than any other Diesel-electric system. Its record of dependability, low maintenance and economy, recorded under every conceivable operating condition, have made it the outstanding choice for both land and offshore applications. Most important, it is the *only* deep well Diesel-electric system manufactured and backed by one company.

The SR-10 is the newest Electro-Motive deep well power unit. It is the first standardized, completely self-sufficient power system. An integral AC generator eliminates need of outside AC power for blowers, excitation and control equipment. The 1000 hp 8-cylinder Diesel engine drives two generators that produce 640-KW each. Models are available for Dual-fuel operation.



Sensitive, accurate control

Controls for the SR-10 combine the "feel of steam" with the instantaneous response and accuracy of electric drive. Compact, centralized panel gives the driller supervision of all Diesel-electric equipment including safety shutdown.



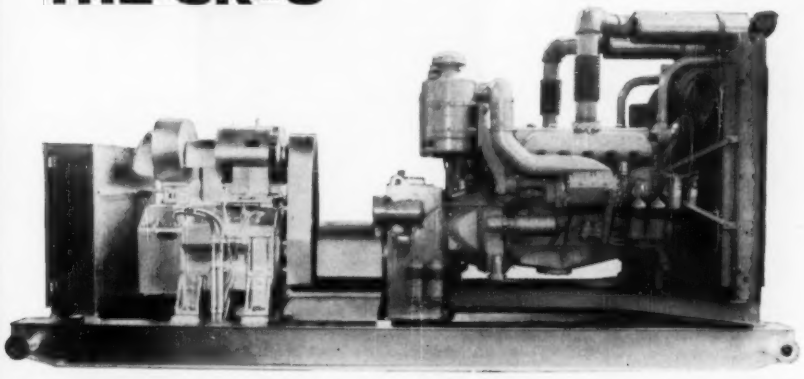
Flexible, positive power

Drive motors for the SR-10 deliver up to 800 hp. The D-49 motor provides smooth and rapid acceleration of loads with positive control of speed and torque. Both drive motors and generators are identical except for field windings, a factor that reduces service costs.

POWER

—*for medium depth drilling*

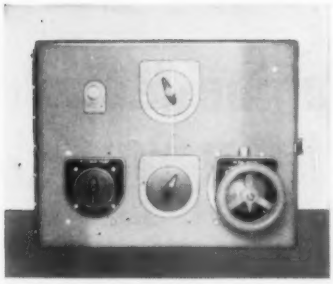
THE SR-5



Simple, economical, adaptable

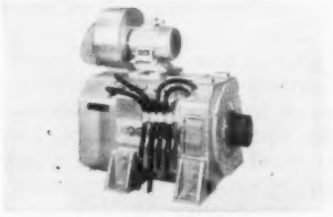
The SR-5 was specifically designed to meet the needs of medium depth drilling. It combines extreme simplicity of design in a compact, portable assembly that saves hours and dollars on rig-up, tear-down and moving operations. Though new in concept, the SR-5 contains the tested dependability, low operating and maintenance features of Electro-Motive SR-10 equipment.

The Basic SR-5 set is a two generator, two drive-motor arrangement. By combining units, drilling power can be tailored to the job for the most economical power arrangement. Skid unit is pictured with a Detroit Diesel engine, though any engine (gas or Diesel) of comparable power may be used.



Driller's Control

Simple control panel of SR-5 requires no special training or electrical knowledge. Sensitivity of controls permit driller to maintain a high drilling rate with complete accuracy and balance.



D-49 drive motor

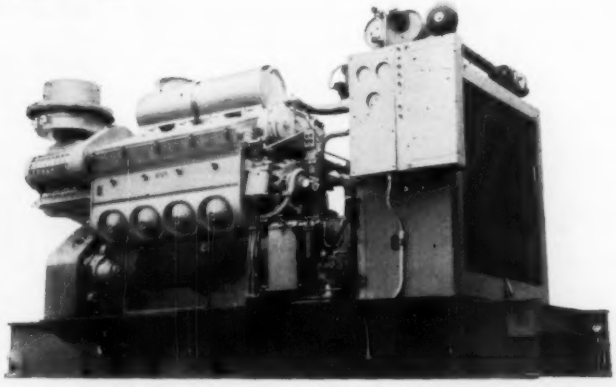
The SR-5 utilizes standard and tested motor components. Electro-Motive drive motors are perhaps the most widely used electric motors for drilling applications. Their dependability and torque characteristics offer speed and power flexibility to meet all drive requirements.

—*for dependable pumping*

THE SK-10

For large capacity pumping operations, the Electro-Motive SK-10 provides a compact and portable skid unit, complete with cooling system and engine controls. The seasoned 567 engine is well suited to the torque and horsepower requirements of pumping applications. The engine is balanced to eliminate any vibration between the set and accessories.

The dependability, low maintenance and economical fuel characteristics of the SK-10's engine have been inherited from General Motors' more than twenty-seven years of Diesel engine manufacture. SK-10 units are available for Dual-fuel operation and heat exchanger cooling.



(Shipping Wt. 32,000 lbs.)

ELECTRO-MOTIVE DIVISION · GENERAL MOTORS

LA GRANGE, ILLINOIS • **Petroleum sales offices:** Houston and Los Angeles

In Canada: General Motors Diesel Limited, London, Ontario

Engine-Mounted Indicator Tells Oil Condition

Changes in lube oil viscosity, independent of the engine's oil temperature, are immediately determinable. Since viscosity is an important index of suitability of lube oil for continued use, monitoring it can be helpful in controlling wear rates.

Operating time before an engine needs rebuilding is determined more by the relatively short operating periods at high wear rates than by the long operating hours when everything is in good shape. Lube oil contamination stands as a principal cause of these damaging periods. It is estimated that on a broad average only something like half of the life built into the engine is actually attained. This estimate is based on mileage increases recorded by bus and truck fleets that have adopted lubrication control systems.

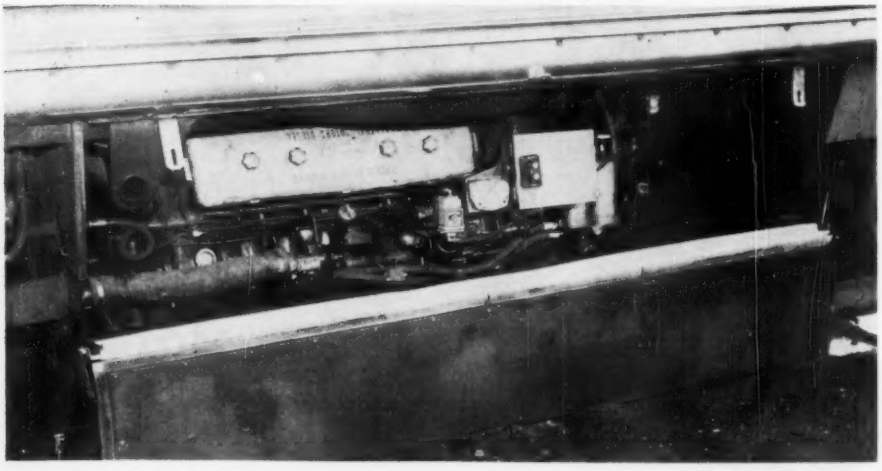
Too often, lubrication is handled by rule-of-thumb. Oil is changed on the basis of hours or miles according to some recommendation. But unless the recommendation is based on analysis of the type of service and operating conditions, it can be meaningless. It might be too conservative and oil is being wasted. Or it can be too optimistic and the oil is used long after it is fit for service. Then the periods of high wear rate begin.

How can you tell?

Saving the engine comes first. Then the question of determining the safe useful life of the oil under a particular set of conditions becomes a matter of establishing a lubrication control system.

Fourteen years ago Gerin Corporation brought out what was probably the first oil inspection kit built specially for engine maintenance and operating men. There was no shortage of laboratory-type equipment, but nothing was available that was suitable for use by operators responsible for day-to-day engine lubrication.

This kit had great influence on recognition of on-the-job oil tests as part of engine preventive maintenance. Case histories demonstrated that its intelligent use produced significant increases in operating time before overhaul, cut down on road failures and reduced lubrication costs. In addition to controlling lubrication,



Gerin's Oil Condition Indicator Meter is shown here mounted on Budd rail car's GM Diesel. Look for it in the center of picture, just below right end of valve cover.

lube oil analysis became a recognized maintenance tool.

Once a representative rate of oil deterioration was established, a change in this rate indicated trouble. For example, a jump in the rate of lube oil dilution by fuel (reduction of viscosity) could indicate injection equipment going bad or even a fuel leak to the lube oil. Railroads, with their vast resources, carried this concept of lube oil analysis as a maintenance tool to a higher scientific level with their spectrographic analysis programs to detect presence of even microscopic quantities of various wear metals.

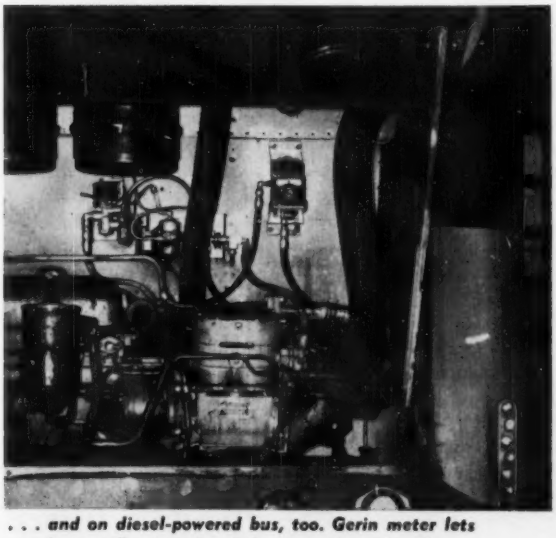
While this high-level type of lube oil control system is excellent and helped the railroads, it is not the answer for everyone or all problems. In fact, even bench-testing of oil doesn't meet all the needs. There arose a growing demand for a gauge-type instrument right on the engine capable of giving some indication of oil condition, automatically and immediately.

Enter the Oil Condition Indicating Meter

Long experience with oil testing convinced Gerin that if he had to pick a single index to show used lube oil condition, he would pick viscosity. Viscosity of oil changes when it becomes deteriorated or contaminated. So it became a matter of building an automatic viscosity meter that would stay accurate under adverse vibration and weather conditions and didn't cost too much.

We saw early models of this meter at the Gerin Corporation in the summer of 1955. Realizing the potential value of such a lubrication control, we have been interested in watching its development to its present full-scale production status.

While engine-mounted viscosity meters are not entirely new, this particular design has a new and remarkable feature. It accurately indicates percentage of viscosity change, either up or down, whether the oil is hot or cold. For example, if an oil's viscosity was reduced 20% by fuel dilution, the meter would read 80% before startup and exactly the same if a reading was taken with the oil hot.



. . . and on diesel-powered bus, too. Gerin meter lets you know oil's viscosity, helps extend engine life.

Gerin's meter mounts right on the firewall—easily checked when you're looking at dipstick.

How it works

Suppose you change oil. A small compartment inside the meter automatically takes in and retains a sample of the fresh oil. Thereafter, the meter compares the crankcase oil with this original sample. This crankcase oil circulates through the meter and around the sample, keeping the specimen oil at the same temperature. This eliminates temperature as a variable when comparing the two oils to determine what change in viscosity may have occurred.

Engine oil pressure keeps the meter ready to cycle automatically (take a comparison reading). Triggering action is either stopping of the engine or closing of the meter's oil inlet valve without shutting down the engine. The meter reading stays when the engine stops. The man checking the dipstick can tell the oil's condition as indicated by viscosity change at a glance and without starting the engine.

And a word on PM

While benefits of preventive maintenance are more clearly appreciated today, the process of determining condition of internal parts during routine inspections is often a matter of listening for sounds indicative of wear or damage. Since to be audible the condition must have occurred, this is clearly not preventive.

For effective preventive maintenance, lube oil condition offers one of the best available indications. It contains signs of fuel getting into the crankcase, build-up of sludges and solids, and gives early evidence of water or antifreeze leaks. These materials are the primary causes of fast wear.

Finally, early indication of changing lube oil conditions such as afforded by the Oil Condition Indicator alerts the operator to the need for action before conditions become serious.

PRODUCT REPORT:

$11.75 INVESTMENT ! lets you pinpoint fuel flow problems

Maintenance Minder fuel oil pressure gauge makes quick, accurate fuel line analysis possible.

Checking output side secondary fuel filter on a GM 6-71

How often have you taken something apart and found out that that wasn't your trouble after all? Jumping to conclusions can be costly. A little careful detective work, investigation and analysis *before* you pull those injectors will often save you plenty of time and money. And now there's a new tool on the market that ends your guesswork, lets you go to the heart of the trouble. Its name? *Maintenance Minder*—new twin to the product of the same name for checking your air systems.

When you've got a balky diesel engine on your hands, it would probably be a good idea to first check out the fuel line before you pull those injectors. Several things *could be* happening inside your fuel system that have nothing at all to do with injectors as such.

At 500-rpm output side pressure on this GM 6-110 checked okay—reading 35-lb.

Locates Line Pressure Drops . . .

For instance, you can use *Maintenance Minder* to check pump's discharge pressure. Air leaks, faulty pump, a split line or bad connection may mean you're pulling air instead of a full fuel load. . . . Then, move on to measure the pressure drop across the filters, primary and secondary. Readings here will tell you much about the clogged or unclogged condition of those filters. If filters aren't allowing the fuel to get through or you've got other restrictions in the line, your gallerys may not be getting adequate delivery pressure. And that means ports won't fill completely in the time that's available. In short, you get a pretty complete picture of the condition of your complete fuel system—and get it simply and quickly. From all reports, looks like tracking down those fuel line pressure problems is something of a cinch with this new PM tool from Hicklin Diesel. Now, lets take a close-up look at the gauge itself.

Maintenance Minder's dial is calibrated in 0 to 100-lb pressure per-sq-in. Rpm ranges and corresponding pressures are also located on the dial. The gauge is steel with plastic lens . . . hose is Aeroquip's. All fittings are brass. Comes in its own handy carrying case. Incidentally, this new tool can also be used to run a check on your engine oil line pressure as well—checking the accuracy of your present instrument panel gauge.

Trouble shooting *with the right tools* can save you money—especially when that testing is non-destructive. *Maintenance Minder* is a good bet for any shop—large or small—doing diesel maintenance work. What the stethoscope is to the doctor . . . *Maintenance Minder* is to today's diesel man!

new LONG LIFE PISTON

Puts CAST IRON WEAR IN TOP RING GROOVE

G and E Wire Insert Piston before machining (left) and after ring grooves are cut (right) showing how the steel wire forms a tough wear-resistant surface on both faces of top ring groove. The ferrous plug molded in the head (for diesel pistons) prevents burning through head and lengthens diesel piston life!

G and E WIRE INSERT PISTONS

★ **Low initial cost—Low cost per mile**

★ **Amazing increase in piston life**

★ **Maintains new engine power and performance**

Here's an entirely new piston design that combines all the advantages of aluminum alloy pistons with the long life of steel in the top ring groove. No noticeable increase in weight. G and E Wire Insert Pistons are real top performers at LOW COST—barely more than ordinary alloy pistons!

This Gillett & Eaton exclusive steel wire insert cuts top ring groove wear and greatly increases mileage between overhauls.

You get longer piston wear at lower cost because G & E Wire Insert Pistons have a pre-shaped steel wire cast right in the piston wall where the top ring is located. When the grooves are machined, this tough wire is cut, exposing the closely spaced hard surfaced bearing points on top and bottom faces of the groove.

CAST IRON

ALUMINUM

GET THE G AND E WIRE INSERT STORY—it will save piston money, maintenance costs, and cut operating costs.

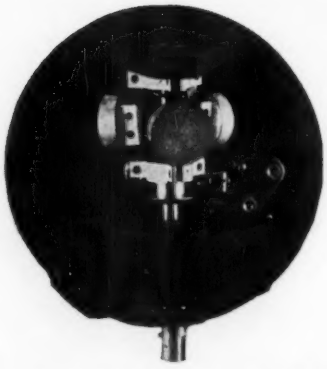
GILLETT AND EATON, INC. 946 DOUGHTY STREET • LAKE CITY, MINN.

SOLD IN CANADA BY GOULD NATIONAL BATTERIES OF CANADA, LTD., FORT ERIE, ONTARIO

ESTABLISHED 1868

INDICATING RPM's

Why you need accurate speed indication of both engines and driven equipment and what one tachometer manufacturer has done to meet this need.



New Reliance Tach: "A more reliable tachometer, easier to read . . . for less money!"

Newton B. Perkins, sales manager for Barbour Stockwell Instruments, sat in front of us with a new Reliance tach in his hand. Knowing their tachs and having used them in the past, the new look of this tach prompted our opening question of the interview.

"Newt, it looks like you've been working over the design of your tachometers. What have you done and why?"

Newt grinned, "I'll tell you first what we haven't done. We haven't changed the basic design that has proven so reliable through the years. Now as to what we have done . . . We've gone over it from dial to case to see how we could produce a more reliable tachometer, easier to read, for less money. We've done it too; prices are down 25% and we feel we have a better product.

"Since the company built its first tachometer in 1909 we've seen the need for reliable speed indication grow . . ."

"Hold it right there! Let's pin down this need for speed indication."

"Let's change that to *accurate* and *reliable* speed indication. After all, instruments are only good as their accuracy . . . and reliability not only insures you get that accuracy over a long time, but it also helps hold costs down.

"As to the need for accurate speed indication, let's talk about the engine first. Speed, pressures and temperatures are the three major indicators of engine performance. Tachs, of course, take care of the speed end.

"Speed is mighty important in both vehicular and industrial applications. For example, you *should* drive a truck by the tach. By keeping the engine operating in a fairly narrow speed band, well up in the range, you always have adequate power available and, what's more, you are assured of operating in the best part of the fuel consumption curve. Engine speeds, of course, are kept reasonably constant and vehicle speed controlled by gear shifting. Your tach can help you avoid lugging—it will tell when you're in the wrong gear and the engine speed is being pulled down.

"Plus, your tach helps you avoid engine overspeeding. Going downhill in the wrong gear or too fast in the right gear can cause engine overspeeding. This is hard on the engine—and in extreme cases can wreck it. Connecting rod bearings are subjected to very high centrifugal loading and you can also get into cap stretch. High rubbing speeds on all parts increases wear and may cause breakage. All this can be avoided when you know your engine speed.

"Speed indication is important in industrial applications too. For example, if you want to run at the continuous-rated speed you have to have an accurate way to set it. If speed's too high, you can get into overloading; too low, and you're losing power or getting it at the expense of high cylinder pressures and temperatures, another form of overloading.

"Then there's the matter of the driven equipment. Its speed can be critical, either for its performance or its safety. On direct drives, equipment speeds can be set by adjustment of engine speeds.

"In cases where drive is variable (a torque converter drive is an example) you might want to know output shaft speed or speed of the driven equipment. Here, a tachometer should be used, often in addition to the one on the engine.

"Then there are, shall we say, indirect uses for engines. Tachometers are necessary when working adjustments, so often keyed to rpm. This holds for test equipment such as dynamometers or fuel injection pump calibration stands, too.

"Believe me, tachometers are a necessity. These are just a few of their uses. With them you'll get the right performance while insuring safety of the equipment."

"Newt, what have you done to your tachometers?"

"The flyweight assembly and the mechanism to translate centrifugal speed sensing into pointer movement is basically the same. It is now mounted on a rigid, one-piece casting. All shafts are ball-bearing mounted to reduce friction. The whole inner assembly has been made stronger and more rigid but through simplification and elimination of parts, costs, including that for assembly, has been reduced.

"One big feature has been redesign of the dials. We got a Boston industrial designer, Cliff Stubbs, to do the job. He even borrowed from studies of instrument dial readability made by the aviation people. Starting with the vivid "day-glo" color of the pointer, the eye follows naturally to the major numeral graduations and from there on to the finer calibrations. Locating the fine calibrations on the outside also gives more room for separation between the lines.

"In all this face-lifting, we were careful to insure that external mounting dimensions remained the same and that the units mate with all standard takeoffs. This can be important if and when replacement becomes necessary. Also, builders that have standardized on our equipment do not have to change their panel boards or mountings."

"We like to think of ourselves as New England craftsmen carrying on the old tradition."

"Hand calibration keeps accuracy to within 0.5%!"

"You spoke about reliability . . ."

"Well, as I've said, we've been in business since 1909 and like to think of ourselves as New England craftsmen carrying on the old tradition. We've records of tachs with up to 30-years service on them—for example, one that was installed on a boat when it was a rum-runner back in prohibition days. Today, we make over 1600 types for different applications.

"All our tachs are hand-calibrated (as far as we know, we're the only manufacturers doing this) before they leave the factory. Accuracy is held to within 0.5%. And they hold their accuracy!. Although we've been able to make substantial price reductions, we're still a little higher priced than some popular makes. But we say, 'Our Reliance tachs are priced a little higher but they cost you less.' Greater accuracy for longer periods makes this true."

"What about the future, Newt? Anything on the drawing boards?"

"More than that. Our Controller is off the drawing board and is about to go into production. It combines three elements—a tachometer, and hour meter and an overspeed switch. The big point is that these all operate from a single drive! Most engines have only a single tach shaft takeoff. Mounting the other two instruments is often a problem—drive complications, space, etc.

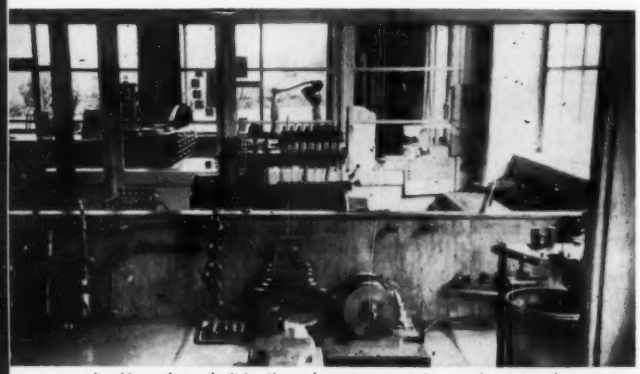
"So here we have a simple answer to these problems and to them you can add the cost of three drives and three separate instruments. We've had prototypes out in the field for a long time and they have lived up to the Reliance tradition. We think we have a really hot item."

"Any final words, Newt?"

"Only to point out again to your readers the need and the value to them of accurate, reliable speed indication. And don't be fooled by first cost of a tach. As we say in our slogan, ours are priced a little higher but they cost you a lot less in the long run."

Electric equipment repair shop with fuel injection repair shop at right rear. Cleaning room is through door in partition at left; battery service room behind electrical testers.

Though diesel volume is high, tooling in fuel injection repair shop can be somewhat simplified since fewer makes, sizes, types and models are encountered than in the average American shop.



Looking through injection shop to receiving and parts-sale counter. Customer access and parking facilities are good. Customers are missing as visit was made on a German holiday.

Service station office for gasoline and diesel fuel, as well as TBA sales, is typical of the whole clean, modern facility.

Look at an RB German Distributor's Shop

Robert Bosch's American distributors attending the recent RB-sponsored Distributors Meeting at the Stuttgart factory visited these facilities of one of their German counterparts.

Joseph Lipp is the Robert Bosch distributor in Aalen, Germany, some 45 miles north of Stuttgart. He is part of RB's sales and service organization in West Germany. He is closest to what we would call a "medium-sized distributor." Plus his own sales and service function, he serves the needs of smaller independent sales and service outlets in his area that provide necessary "grassroots" service to RB equipment users.

Throughout continental Europe and particularly in Germany, RB is a dominant factor in automotive electrical equipment, fuel injection equipment and certain household appliances. Their automotive products are extensively used as original equipment by German car, truck and tractor builders . . . some French, Italian, and Swedish builders too.

In-use volume is high enough so that distributors can operate successfully on an exclusive representation basis. For example, Mr. Lipp handles no competitive lines. Drawing on both gasoline and diesel-powered equipment, his sales and service volume is sufficient to keep a work force of 50 to 55 people going. Of course, there's the appliances too.

His building is representative of standard plans set up by RB as a guide. New construction such as in this case can take better advantage of the excellent layouts than where modification of existing buildings is involved. Plans provide for complete shop facilities including vehicular drive-in space; parts and units storage, attractive sales facilities including fuel sales. A commentary on the extent of dieselization in Germany is that most fueling stations have at least one pump for diesel fuel.

Fuel injection equipment repair is somewhat narrower in scope than in our average shop. In this rural area, bulk of the work comes from cars, trucks, buses and tractors. Relatively few pump, governor and nozzle types are involved. Governors are principally pneumatic, others mechanical, with hydraulic units rare. Total work volume is spread over only a few models. Tooling is simplified. Also, this condition lends itself to exchange programs without excessive inventory.

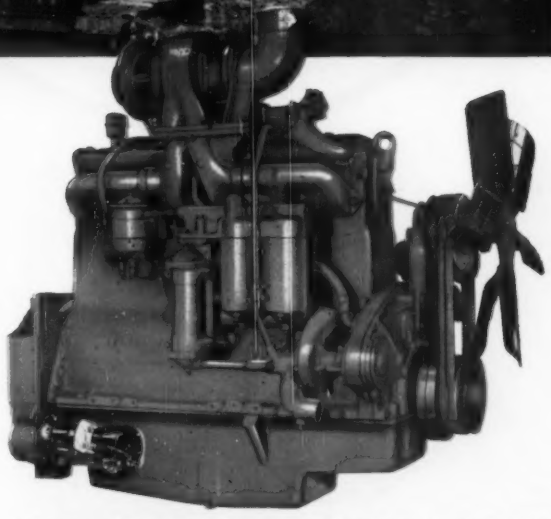
All together, it was a business-like, attractive shop, a credit to Mr. Lipp and to the Robert Bosch organization.

Here's TEAMWORK FOR PROGRESS

This 3½-yd Koehring 1205 has torque-converter drive — also available with mechanical drive.

NOW...

Koehring 1205 is powered by 21000 Diesel



Several factors influenced Koehring engineers to select the Allis-Chalmers 21000 diesel for their Model 1205 crane-excavator.

Outstanding performance, of course, was the prime convincer. The 21000 provides plenty of power — and still works at far below its design capacity. Torque is consistently high throughout the entire working range — for both lugging ability and top performance at high speeds. Users report quick starting, without ether, in sub-freezing weather.

Modern design of the 21000, with its entirely new controlled-turbulence, open-combustion system, appealed to Koehring.

Big fuel savings — The turbocharged 21000 uses 8 to 27 percent less fuel than other diesels in its class. That means savings of up to 1 gallon in every 4!

Dependability to match — Since fuel is *burned* — it isn't left to "gook" up rings, valves, crankcase. Raw fuel doesn't wash away or dilute lube oil. Fuel makes horsepower, not waste heat. Further, there's tough, heavy-duty design, with "stay-on-the-job" durability in every part.

Pluses like these have led Koehring and other manufacturers to standardize on the 21000 and the companion naturally aspirated 16000 diesels. Get full information from your dealer or contact Allis-Chalmers, Engine — Material Handling Division, Milwaukee 1, Wisconsin.

Go first class... use

ALLIS-CHALMERS

power in all your equipment

TEAMWORK FOR PROGRESS

BC-30

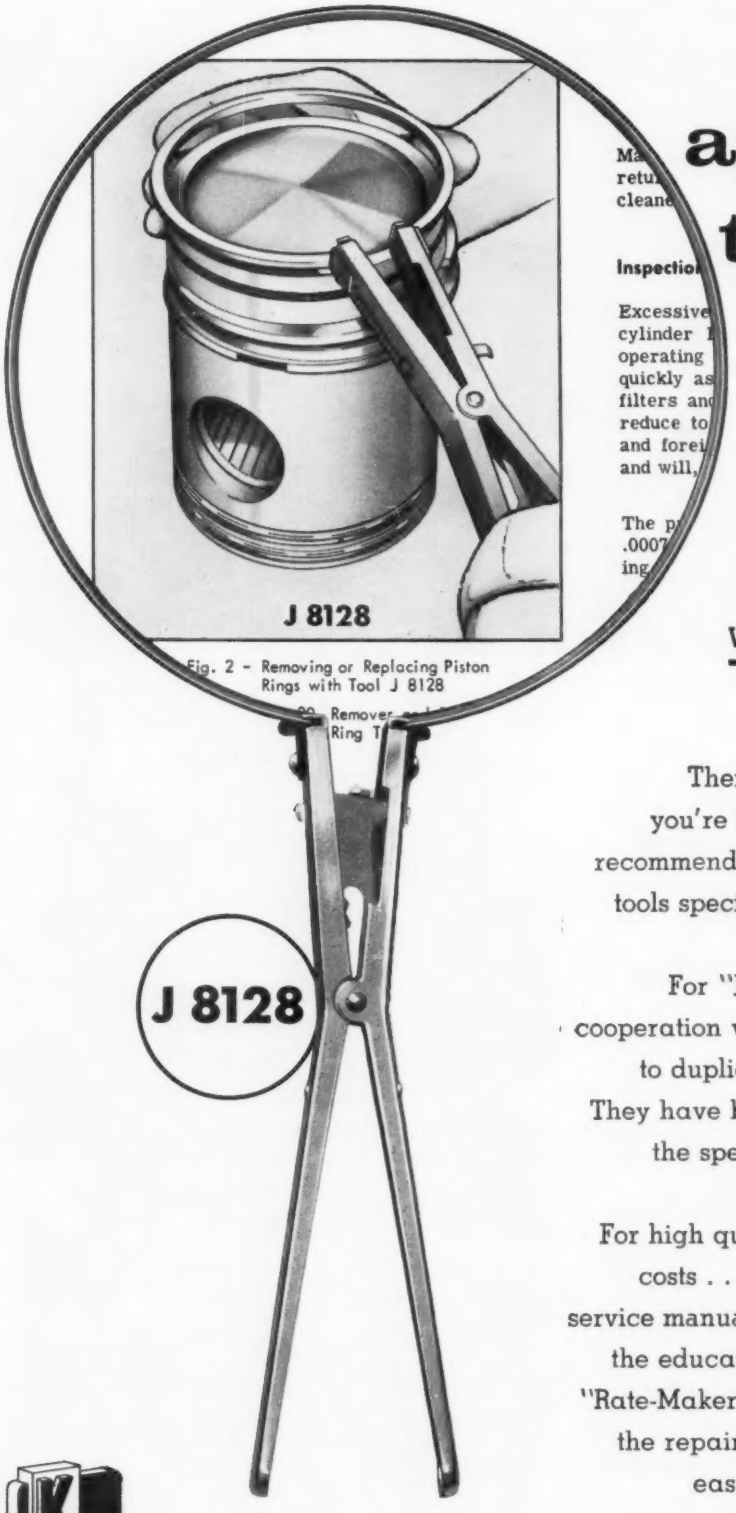


Fig. 2 - Removing or Replacing Piston Rings with Tool J 8128

from apprentice to service expert ...FAST!

With K-M special service tools!

There's no shortage of service skill if you're following O.E.M. service manual recommendations and using the "J" number tools specified in these service instructions.

For "J" number tools are developed in cooperation with the equipment manufacturer to duplicate factory assembly conditions. They have built-in ability to greatly increase the speed and skill of your service staff.

For high quality service jobs at lowest labor costs . . . look for the "J" number in your service manual . . . the number that designates the educated tool for the job; a Kent-Moore "Rate-Maker" tool specially designed to make the repair or service job simple, quick and easy without risk of damaging parts.

60-H2

KENT-MOORE ORGANIZATION, INC.

28635 MOUND ROAD, WARREN, MICHIGAN • ENGINEERS AND MANUFACTURERS OF SERVICE TOOLS AND EQUIPMENT

New Trend:

DRIVE BY PYROMETER . . . SHIFT BY TACH!

Monitoring your exhaust temperatures protects engine and turbocharger . . . is guide to improved performance.

One of Western Express' big Mack Double-Bottoms rolled along Ohio's turnpike toward Cleveland. The driver's eyes, moving routinely across his instrument panel dials, suddenly spotted trouble!

That new instrument—the exhaust pyrometer—was reading 1275°F exhaust temperature, way out in the red.

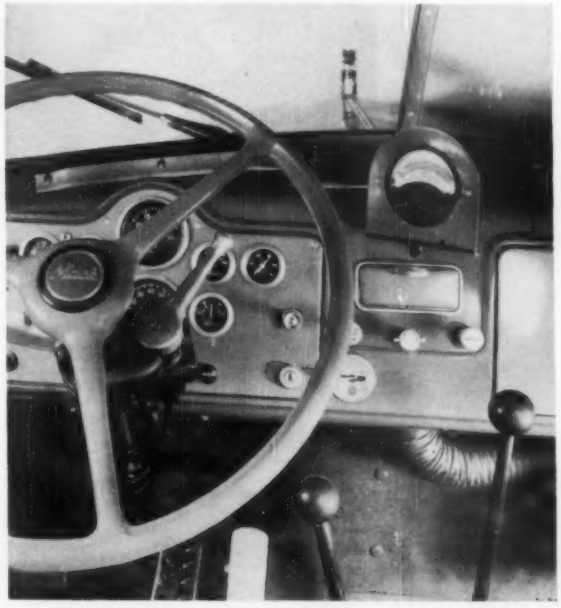
The trouble? It was starving for air, air cleaner clogged . . . overfueling had sent exhaust temperatures dangerously high. But the pyrometer caught it, and caught it *before* damage could be done to either engine or turbocharger.

"We're making pyrometers standard equipment on all our trucks," stated Western Express' Wally Smith. "We consider 'em a *must* for every piece of diesel equipment—especially our Double-Bottoms. That pyrometer tells you quite a story when you understand it . . ."

What pyrometers do, why you need them . . .

Mack now offers pyrometers as optional equipment on all Mack "B," "G," "H" and "N" models. Temperature sensitive thermocouples, installed in either the exhaust pipe near the manifold flange or at the turbocharger discharge pipe, are connected to a dial on the dash that is calibrated in simple color bands—green for normal operation, red for when your engine is operating at dangerously high temperatures.

Beauty of the pyrometer is that it gives you ample warning *before and independent* of any cooling water temperature indication—*before* damage can be done. Measuring exhaust gas temperatures, it warns the driver when cylinder temperatures are excessive. This can be the result of "lugging" or overfueling. Lack of adequate intake air either from a plugged air filter or the result of high altitude operation are typical causes of harmful overfueling. Also, it could be due to malfunction of the injector system or governor.



Mounted up in the cab where it's easily visible—pyrometer uses unique color-guard system. Green for normal operation, red when she's getting too hot!

Danger to the engine lies in the effects of high cylinder temperatures and in some instances, accompanying high pressures. Piston heads and valves can burn, rings break from high impact forces. When periods of overloading are prolonged, the cooling system can't keep up and the engine may well overheat and seize up. As for turbochargers, they respond to the heat energy in the exhaust. If the imput heat is excessive, the turbine wheel and nozzle ring can get too hot for the metal used and in any case will tend to overspeed as the result of adverse operating conditions. At excessive speeds, damage will be done even to the point of destruction.

When the driver sees the pyrometer pointer "in the red," he can avoid lugging by a downshift. If temperatures stay high, he can cut fuel by easing up on the throttle. In extreme cases the driver may have to pull over and idle his engine, letting the hot cylinder parts cool gradually, and thereafter drive so as to maintain exhaust temperatures "in the green."

Where are pyrometers being used today?

Pyrometers are not new to the diesel field, being practically standard equipment on large stationary and marine engines. In this application, thermocouples are installed at the exhaust outlets of each cylinder and the instrument becomes the operator's first-line-of-defense against cylinder overload, underload or malfunction. Illinois Testing Laboratories (Alnor), the principal supplier of these multi-point pyrometers, also builds this unit for Mack.

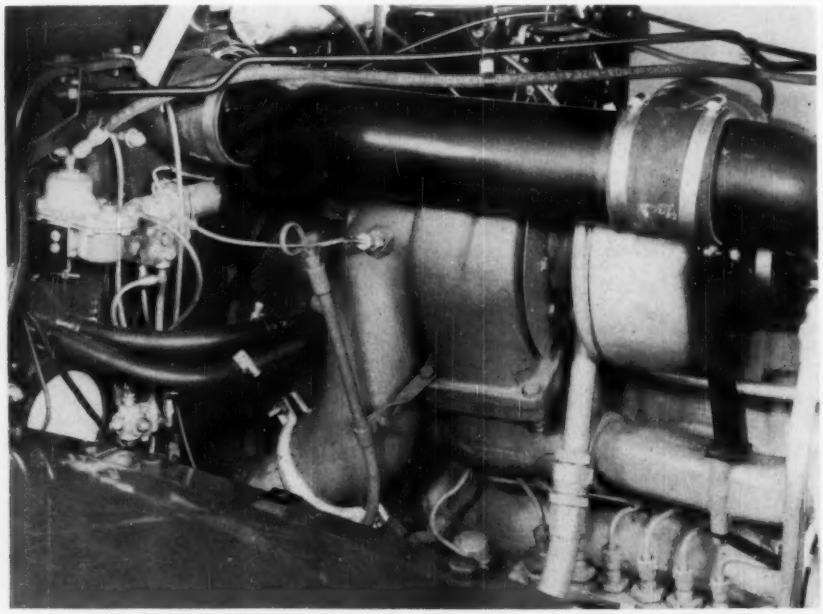
What is new is application of pyrometers to the smaller high-speed engines. No. 1 users are the big, long-haul truckers operating out west. Their turbocharged Macks are pulling heavy loads . . . at high altitudes where, if you're not on guard, thin air and steep mountain roads can produce temperatures that may play havoc with a valuable turbocharger. Truckers consider their new pyrometer "a very cheap investment, considering what it's protecting us against."

To sum up . . .

Mack's pyrometer can be a valuable and profitable tool. It warns drivers when the engine and/or turbocharger is being abused, either through method operation or some malfunction or condition which they cannot control directly. In either case, drivers can then alter operation to ease the high exhaust temperature condition and thus avoid serious engine and/or turbocharger damage. Without the pyrometer, they may not even be aware of the condition until something drastic happens.

When excessive exhaust temperatures are due to equipment condition, the pyrometer warns of what's happening and it can be corrected before it becomes serious. Thus, it is a guide to better engine performance, a means to extend equipment life and cut maintenance costs—*if it is* used.

"We're running a driver education school here at Western Express," says Wally Smith. "And one of the biggest things we're concentrating on is teaching our drivers to, *'Drive by that pyrometer . . . and shift by the tach.'* We have to watch our costs pretty carefully —and that new Mack pyrometer is helping us do it!"



Thermo-couple is tapped into turbocharger discharge pipe. . . . Users claim the "py" is helping cut maintenance costs, protecting both engine and turbocharger. Pyrometer is also seeing service in fire engines—where pumpers operate for long periods during fires.

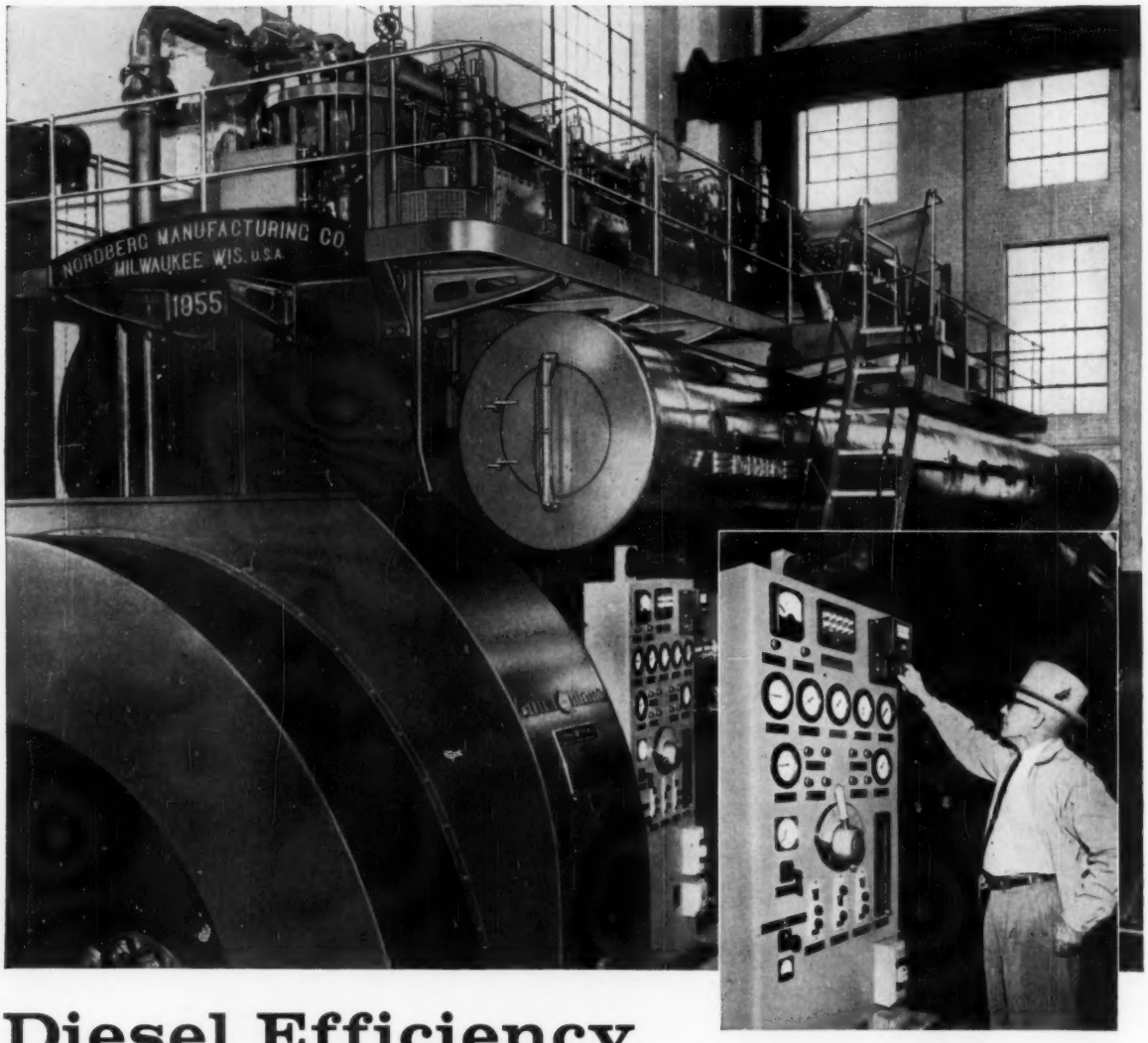
Total output of the original engines which, according to „The Motor Ship", were installed in 1959 in ships exceeding 2,000 tdw.

For the 217 motorships above 2,000 tdw that were equipped with original engines built by the seven most important manufacturers of large marine diesels, the Augsburg and Hamburg works of the M. A. N. supplied 82 engine plants totalling 444,520 BHP (metric). The total output of the engines supplied by M. A. N. and their licencees in 1959 is 823,350 BHP (metric).

M·A·N

MASCHINENFABRIK AUGSBURG-NÜRNBERG AG · WERK AUGSBURG

REPRESENTED ALL OVER THE WORLD



Diesel Efficiency Checked Instantly

with the *Alnor* Multi-circuit Pyrometer

Checking the exhaust temperature of each cylinder, by the turn of a knob on the Alnor Pyrometer, gives assurance of the operating efficiency of this diesel. Photo, Nordberg Diesel 8500 h.p. installation.

Most diesel power plants operating today are Alnor equipped. Either with the Alnor Pyrotac which has an automatic motor driven switch unit that monitors the exhaust temperatures of each cylinder and gives an alarm signal if the temperature varies above or below a set safety range, or with the multicircuit pyrometer, hand operated as shown here.

A turn of the knob on this Alnor Multi-circuit Pyrometer will give an instant check on the operating efficiency of each cylinder by indicating the individual exhaust temperature.

Improper injection, blow by, stuck rings, failure of cooling, overload, or other malfunctioning of the engine can be immediately detected by checking the exhaust temperatures of each cylinder as indicated on the Alnor Pyrometer. The low cost of Alnor pyrometric instruments compared with the protection they provide for diesel installations makes their place on the control panel indispensable. That is why most diesel power plants are Alnor equipped.

Alnor INSTRUMENTS

ILLINOIS TESTING LABORATORIES, *Inc.*

Room 507 • 420 North LaSalle Street • Chicago 10, Illinois

Andy makes injector pump adjustments . . .

PERSONALIZED FIELD SERVICE PAYS OFF

Andy Perkins really gets around—but the man-in-the-field needs good shop "backstopping"

story and pictures by **Paul B. Harder**

Andrew Perkins climbed to the tractor seat, goosed the throttle and squinted appraisingly at a plume of white exhaust smoke. The farmer watched Andy's face hopefully. After five minutes of hustling between driver's seat and injection pump, Andy signalled the farmer that his tractor was ready to roll.

"We'll have to clean those injectors sometime soon," shouted Andy over the roar of the engine. "Let me know if she acts up any more."

Andy climbed into his truck and sped off. He had completed another of the thousands of routine calls that have made the Perkins Diesel Service of Mesa, Arizona one of the most successful operations of its type in the country.

"Let's face it," mused Andy. "If you can't offer a man on a farm service, you can't hardly offer him anything. Crops won't wait."

Back in his shop, Andy waved toward a caster-mounted rack filled with what appeared to be new fuel injection pumps.

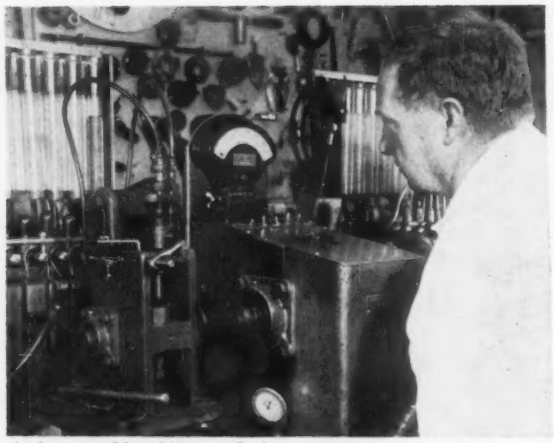
"People around here know that when their diesels start acting a little sour, all they have to do is call me. It may be a pump, it may be injectors, it may be both or neither. But we'll be there with replacement injector equipment as soon as our truck will get us there."

A business based on personalized service . . .

Andy didn't develop his service operations by accident or through customer pressure. Long before he started this business—while contracting heavy equipment repair and service work for construction firms during the war—Andy Perkins dreamed of doing just what he's doing now.

Perkins Diesel Service is in a class by itself. You only have to ask a few of Andy's customers to know that. Field service on fuel injection equipment is the heart of his operation. Much can be said about Andy's shop operations—all of it good. But it is generally acknowledged that it is his service function more than his careful attention to mechanical details in the shop that accounts for his firm's success and his personal stature among diesel users in the state of Arizona.

Perkins Diesel Service backs up its field service operation with high quality precision shop work. Any other competitive operation must be measured against this combination of service plus top quality work. His



Andy assembles GM matched-set injectors, output ranges are kept to within 1%.

willingness to drive 50 miles to replace a $20 pump and tune an engine is matched by his insistence that the shop's work be as good as human skills and modern equipment can make it. His efforts have been rewarded by an ability to unhesitatingly ask for, and get, top money.

Andy's field service operation has proven that, at least in this area, users want this kind of service and are willing to pay for it. In a razzle-dazzle pickup specially fitted for the purpose, Andy or any one of four others working with him (including his two sons, Ronald, 26 and Kenneth, 21) will go out to the ailing equipment, not wait for the user to disassemble it and bring the parts to him. Drawing upon his own revolving stock of completely rebuilt and tested replacements, he will take with him those units which might be needed to get the diesel back in production.

Andy's shop uses strobotac to check spray patterns.

In the field, the mine or on the construction job, Andy or his men will go to work and stay with the engine until it's functioning perfectly or diagnosed as being in need of more drastic repairs. This may mean a 16-hr day—and it frequently has. Andy, however, insists that his firm operate on this basis.

Replacement injectors are charged out on the basis of an established exchange price. Pumps are replaced at a flat labor cost rate plus parts used to bring the replaced unit up to latest factory specifications. Thus, the labor rate for an American Bosch PSB is $22.50. Repair labor for the International TD-18 twin plunger pump is established at $43. Other commonly-used pumps range between these two figures. Replacement parts are, as noted, added to these labor figures.

In addition, Andy charges 10¢ a mile for travel, plus $5.50 an hour for trips away from the shop involving injection work and $4.50 an hour for non-injector service work.

Pumps and injectors coming back to the shop are subjected to an exhaustive program of rehabilitation.

Pumps and injectors are stripped down entirely, and all but the high-precision parts, soaked for three to four hours in a stainless-steel tank of Turco Transpo. Parts are steam cleaned, then housings, covers, bodies, etc. individually cleaned with non-liquid sandblasting. In addition to this, injector bodies are soaked in Phos-It heat-scale remover before sandblasting.

Modern equipment is available for pump calibration and for the grinding and lapping operations common to this type of repair. This includes flat lapping for metal-to-metal fits, injector needle face grinding and nozzle seat lapping.

Individual injectors are flow-tested for delivery volume. Not infrequently Andy will use a Strobotac to check spray patterns.

Injector Matching is important . . .

The degree of precision Andy Perkins demands is suggested by his handling of General Motors injectors. On a special test stand, each injector, following cleaning and assembling, receives a 500-stroke test. Injector output is measured carefully and noted on a card hooked to the injector. This information is typed on the label of the replacement box in which the injector is packed. They are then arranged in matched sets in which output between, say, six injectors does not vary by more than 1%.

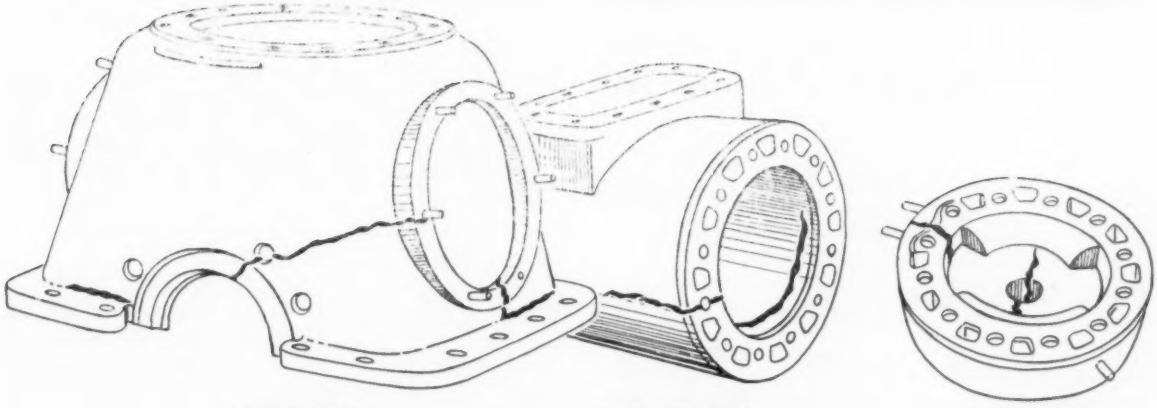
"In spite of everything you hear to the contrary," notes Andy Perkins, "these injectors can have a variation of as much as 10%. Our ability to provide users with matched injectors has done about as much for our business as anything I can think of. It's surprising the difficulties you solve by using matched injectors on these engines."

Assembled and tested units are painted with standard factory colors for the equipment involved. Machine threads, exposed nozzles and easily damaged fittings are all protected by either metal or dipped plastic.

(*Continued on page 58*)

METALOCK

A Cold Process for Repairing Cracked or Broken Castings



FRAMES **CYLINDERS** **HEADS**

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ON THE WEST COAST
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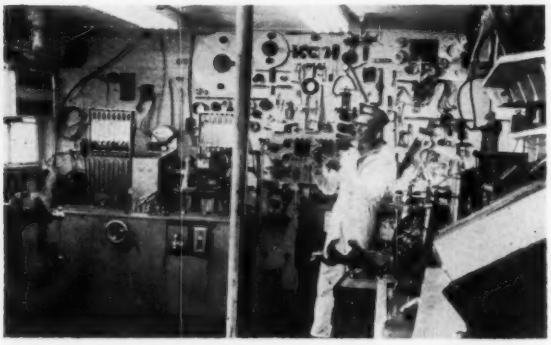
1115 N. Alameda St., Compton, California
NEWMARK 5-8397

IN CHICAGO
Metalock Repair Service, Inc.
3227 S. Shields Avenue, Chicago, Illinois
VICTORY 2-4828

Personalized Field Service . . .

(*Continued from page 56*)



Tony Lesnett assembles a rebuilt injector . . . Andy Perkins is a bug on keeping his Arizona shop neat 'n clean!

Completed, these pumps and injectors go into Andy's stock. The respective customers are billed for the parts used in bringing the pump up to factory specs and Andy, more than likely, has already got the newly rebuilt unit on its way to another user.

Personalized service can pay off . . .

The concept of field service backed up by top-notch shop work has been successful for Andy Perkins. He points out, however, that "service" is more than a word; it is a commodity you offer the customer that he must be satisfied with and willing to pay for. Make it good enough and fast enough and he'll buy it.

Good shop backup is also essential. Perkins Diesel Service is franchised by a number of fuel injection equipment manufacturers and thus has access to their parts and technical assistance. Also, the firm is an ADS member and Andy participates actively. This is another way that he keeps on top of the latest techniques and practices.

How does Andy Perkins develop business from farms, mines and heavy construction firms scattered around the state?

"We've relied on our customers to advertise for us," laughs Andy. "Firms running diesel equipment quickly find out who they can call for fast, reliable replacement service. I make it my business to be sure we're faster and more reliable than anyone else in the area."

Field Calibration . . .

(*Continued from page 32*)

had their way would do nothing but "as-new" rebuilds. Less complete jobs are always potential headaches, principally because customers expect more than they are willing to pay for. A measure of understanding would help tremendously.

In fact, the ADS has a project underway to help this situation. It will spell out different job classifications, telling exactly what is involved in each type of job as well as spelling out limits of responsibility and warranty. A by-product of this job standardization is protection of the customer.

Earlier, price cutting was mentioned and cutting corners on the job was cited as one way of quoting lower prices. If job standards are spelled out, the customer has a better idea of what he's getting for his money. Price alone means nothing. One shop can be quoting on and expects to do a complete "as-new" rebuild. The other quotes on the same terminology but does little more than a clean-up, patch-up job. When they come off the stands, both pumps may do approximately the same job *but for how long*. You'll never get a full life cycle out of the partially worn parts in the patched-up pump. Clarification of terminology and job standardization will help this situation to the benefit of both shop and owner.

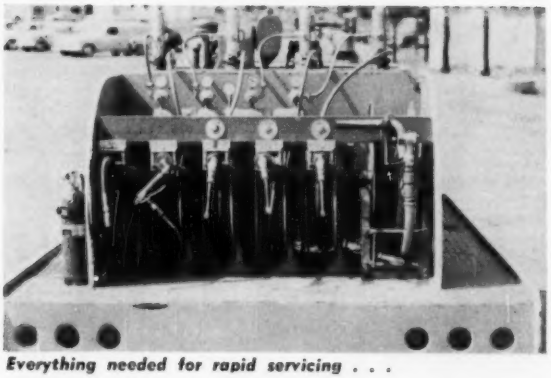
One other owner influence bears comment since the practice reflects on the accuracy of field calibration. Shops report pressure to set pumps to deliver as much as 120% to 140% of normal maximum fuel. Results are more power . . . also smoke and potential engine damage. Turn the business away and the customer goes to someone else who will do the job. Again, the owner has the right to do what he wants—*if he accepts the responsibility*. Unfortunately, such abuses often wind up in warranty claims and all fingers are pointed at the man who set the pump.

So how good is field calibration . . .

The capability for good field calibration is excellent. There are good well-equipped shops all across the country that can do the job as good if not better than the factories. Stick to reputable shops and pay the price commensurate with quality work and you'll get it.

Furthermore, the whole climate in which field calibration operates is improving. In addition to the standards mentioned, now in being and on the way, there is a greater-than-ever-before flow of technical and experience data. It's a good thing, too, because engine builders are getting more power from their engines than ever before and the need for greater accuracy in field pump calibration has increased.

Finally, owners can have good field calibration right now—if they want it and are willing to pay a fair price for quality work. Remember, you can get what you demand and also you get only what you pay for.



Everything needed for rapid servicing . . .

. . . fuels, lubes, compressed air, filters!

Service Shop on Wheels

Specially-outfitted truck provides on-the-spot service for widely-scattered equipment on giant Canadian irrigation project

by Louis Begin, Equipment Maintenance Supervisor

Bow River Irrigation Project, Vauxhall, Alberta, Canada

How do you take care of daily servicing and preventive maintenance when your equipment is scattered all over the landscape? That used to be our problem up here on the Bow River Irrigation Project in Alberta. It wasn't unusual, for instance, to have one of our draglines working on a drain ditch 50 miles away from any of our other equipment! Crawlers, dozers and scrapers often were 30 and 40 miles apart. This kind of situation *can* lead to hit-and-miss maintenance . . . *can* lead to breakdowns with long, costly downtime. So we decided to do something about it . . .

Two years ago, in 1958, we set to work building ourselves a customized service shop on wheels. What went into it? Well, first of all we welded a 360-gal tank to carry the diesel fuel and a 24-gal gasoline tank. Then we installed a pump on a power takeoff. Meters were installed so that we could keep a careful record of fuel used by each piece of equipment serviced. Also, we put a filter on the line—because it's been our experience that water and dirt in the fuel can cause you more "downtime" troubles than just about anything else.

Next, four air-operated pumps were set on the truck to handle the crankcase, transmission, hydraulic oils and chassis lubrication. We also installed meters for all of them except, of course, chassis lube. Then we took care of compressed air supply—using a 16-cu ft compressor.

All hoses are on spring-loaded reels—except the diesel fuel hose. We decided to use a 50-ft air hose because you need plenty of play when checking scraper and grader tire inflation. We also decided to carry a spray cleaning gun attachment for the air hose—it's mighty handy, does a quick efficient cleaning job with gasoline on the machines where we have to open them up, say, those filter housings before element changes.

That completed the basic requirements. After that we set to work outfitting our truck with a few necessity extras . . .

We built in separate compartments to store oil and fuel filters for all the different kinds of engines we'd be servicing. Then, we fixed up places for a fire extinguisher and a first aid kit . . . and a rack for the battery water. A coat of blue paint and red trim and she was ready for the road!

Mobile Maintenance . . .

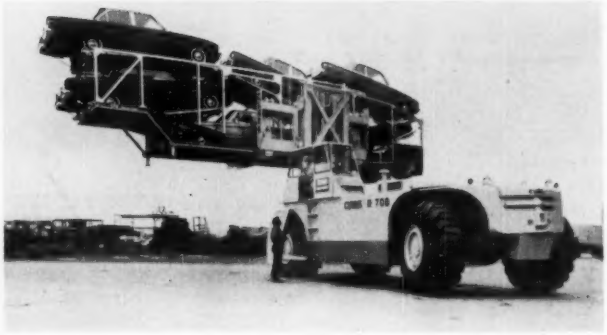
Before starting his daily rounds with our service truck, the operator always stops by the Bow River Irrigation Project office each moving—checking up on where the different machines will be that day. During the course of an average day he'll drive over 125 miles, servicing equipment that's working on the dams and gates, the canals, laterals and drain ditches . . . as well as the stationary diesels that supply electrical power. It means a lot of chasing, too!

During the summer our equipment is usually scattered, often over a 50-mile area. Plus, it doesn't stay put for very long. A dragline may have only two day's work in one place and the next job may be 10 miles away. Our crawler tractors may have two new concrete structures to backfill using a dozer . . . and the next day it may be working 20 miles away working with a scraper building up a ditch bank. It's quite a job keeping up with daily PM requirements—but our service shop on wheels is doing it!

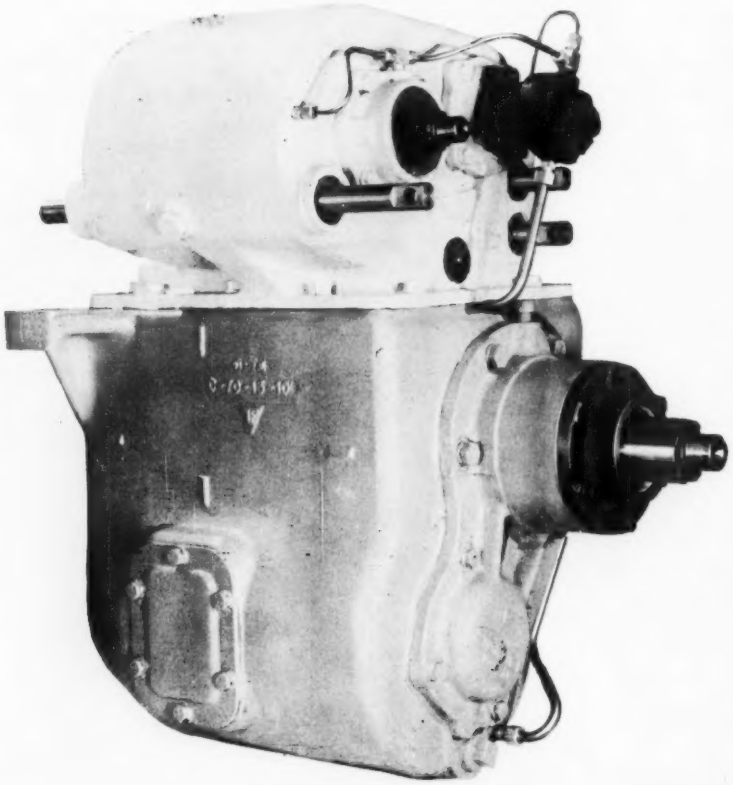
We believe this mobile truck of ours has been the answer to good, efficient maintenance of our diesel-powered fleet. It's been a tremendous help in keeping the fuels and lubricants that go into our equipment clean. What's more, from our improvement in equipment records during the past two years, the truck has *more than* paid for itself.

diesel power new products

Falcons In Flight . . .
These six Ford Falcons aren't even *half* a load for the new 35-ton capacity Clark Equipment Ranger-700 fork truck. It's the largest fork lift *anywhere* —GM Detroit Diesel 6-cyl, 219-hp supplies the power.



Use your dp Reader Service Card.



New Top-Mounted PTO
Dana Corporation has a new top-mounted power-take-off unit that features forced feed lubrication, operates under heavy work loads at low speeds without causing damage to bearings and gears. Tapered roller bearings are insured positive lubrication . . . separate oil pump keeps bearings lubricated at all speeds regardless of vehicle angle.

MORE NEW PRODUCTS FOLLOW ►

NEW
ACTUALLY 3 SPRINGS IN ONE!
As shown in this enlargement, the tri-coil spring is composed of 3 integrated coils. The spring's amazing strength and durability are the result of this triple-coil design.

HEAVY-DUTY OIL RING WITH

TRI-COIL OFFSET SPRING

solves tough oil control problems—
and only Perfect Circle has it!

Exclusive new Perfect Circle tri-coil spring has maximum area of contact with the ring all the way around—provides more uniform pressure than an ordinary hump-type expander. This results in higher cylinder conformability with less friction.

And, the stainless steel spring is offset in a channel next to the ring slots, rather than being directly behind them. Ventilation is greatly increased, and clogging of the ring and spring is reduced to a minimum.

Heat stability and easy installation are two more of the many more outstanding features of the new Perfect Circle OS 89. Get complete information from your Perfect Circle representative today!

PERFECT CIRCLE

PISTON RINGS • PRECISION CASTINGS
POWER SERVICE PRODUCTS • SPEEDOSTAT

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GArden 2-7643
2425 PARK ST., FINDLAY, OHIO
Send Your Worn Units Today!

NEW PRODUCTS . . .

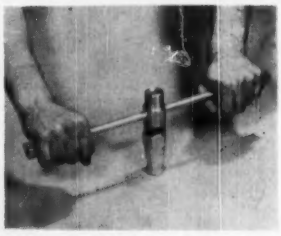
(Continued from page 60)

Fix It faster with New Impactool

Getting right in there to do the job faster and easier, the new, smaller, more compact size 810 Impactool by Ingersoll-Rand, cuts time on repairs, assembly, and disassembly.

Versatile and adaptable, it delivers 1000 impacts per minute with a free speed of 4300 rpm. A ¾-in. square drive is standard equipment, and a 1-in. square drive or ⅝-in. hexagon recess are also available.

Use your dp Reader Service Card.



Bi-Way Studder Does A 2-way job

The Bi-Way Studder is a double duty stud driver and extractor which will extract with no damage to stud.

Manufactured by E. V. Nielsen, it can be used for either hand or power tool operation, and is available in four sizes from eight to ¾-in. in NF or NC threads.

Extension shafts permit use in hard-to-get-at places for repair and maintenance work. Interlocking construction prevents accidental misalignment, seals out dirt and grit for smooth operation. Serrated collets provide secure gripping action, remove broken or damaged studs even when as little as ⅛-in. of the stud can be gripped!

X-4 GEARED HEAD WRENCH
Not a ratchet . . . but a heavy-duty geared tool!

VERSATILE! — used wherever ¾"—1"—1½"—2½" sockets are used. Effectively replaces sledge-type wrenches on many applications. Available in capacities up to 12,000 foot pounds.

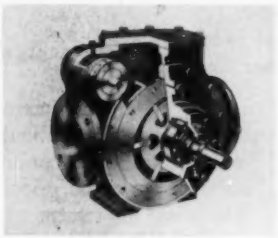
POWERFUL! — Geared head construction generates high torque (4 to 1 ratio) with a fraction of effort. Designed compactly for maximum strength . . . minimum weight.

EFFICIENT! — Eliminates the need for extra man-power. One man can use it — anywhere. Unequaled where space is limited.

SAFE! — Allows workman to perform his duties without excessive strain or fatigue. Hazards of impact or sledge type wrenches are eliminated.

For complete information see your local distributor or write direct to:

X-4
THE X-4 CORPORATION
Dept. DP-7 West Acton, Massachusetts



Simply Turn the Dial!

Yes, you just dial in the desired flow rate from zero to full capacity without changing the pump speed when using the new line of variable-capacity rotary pumps manufactured by Blackmer Pump Co.

The Vari-Flo can be powered with any standard-speed motor, providing all the advantages of more complicated and expensive variable-speed drives formerly needed. This new pump also reverses its flow while operating simply by "turning the dial."

Vari-Flo pumps will be most welcome where a change in flow rate is required to meet varying delivery conditions—such as filling storage tanks, trucks and drums with the same pump operating at successively lower capacities. Here one pump pinch hits for several! Also helps when the change in flow rate is needed to meet a varying liquid condition such as viscosity. And . . . again . . . in liquid proportioning, where one or more Vari-Flo units are combined into a complete system for accurate blending of heavy or light liquids in any desired ration.

Vari-Flo pump is currently offered in three basic sizes (2, 3, and 4-in) providing capacities up to 450-gpm.

Use your dp Reader Service Card.

Maintaining that Battery!

Hughes Electronics Company's new line of Silicon Full-Charge Battery Maintainers can be left on indefinitely without overcharge, overheat or damage to the battery, according to the manufacturer.

Designed for use in farm vehicles, road equipment, fire trucks, airplanes, boats, cars, etc., the unit is completely miniaturized for use in small areas.

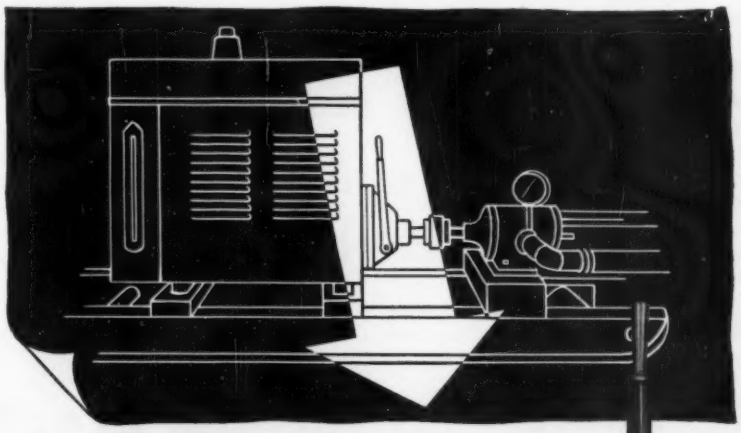
Using standard 115 volt, it is adaptable to battery systems of 6, 12, 24, 32, 48 and 72 volts.

New European Import Promises Better Engine Performance

A new additive is now available in this country. "Autol Desolite" has been used in diesels for many years in Europe and is recommended by many of the leading diesel engine manufacturers over there. "Autol Desolite," it is claimed, goes to work inside your engine almost immediately—removing combustion residues in your combustion chambers and exhaust passages. It is said to be exceptionally effective on the piston head as well as in your upper ring grooves and exhaust valves. This new additive removes those troublesome carbon incrustations on the nozzle holes . . . inhibits both lacquer and carbon deposits on the nozzle and needles . . . reduces corrosion and friction.

Sounds like it's worth a try, doesn't it? It's being marketed in this country by American Oil & Supply Company.

(Continued on page 64)



POWER when you need it!

Year after year . . . Rockford PTO's work smoothly, efficiently, and without maintenance in the Oil Fields. Now they are being specified by more and more oil men as a dependable component of new equipment. Next time, specify a Rockford Power Take Off and rely on the fact, you've selected the best — write for information and specifications.

Available in a wide range of sizes for all popular makes of engines.

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ROCKFORD, ILLINOIS

Export Sales
Borg-Warner International
36 So. Wabash, Chicago, Ill.

(Continued from page 63)

This one's handy Around the Shop!

There's no end to what this new portable floor crane can do with its 3-position arrangement! Thern Machine Co.'s made this one with telescoping mast and boom for exceptional reach, lifting and moving possibilities.

Model HC58A Hydro-3 crane provides a maximum reach of 62-in. and a maximum boom height of 105-in. At this position, load capacity is 700-lbs. Fully retracted, it's 1500-lbs.

The operator chooses the speed, and the 2-in. ram type cylinder automatically moves up or down with the mast.

Boom can be dropped completely out of the way for easy clearance of low doorways and for transport or storage.

Push-Button Can Cleans Electrical Equipment

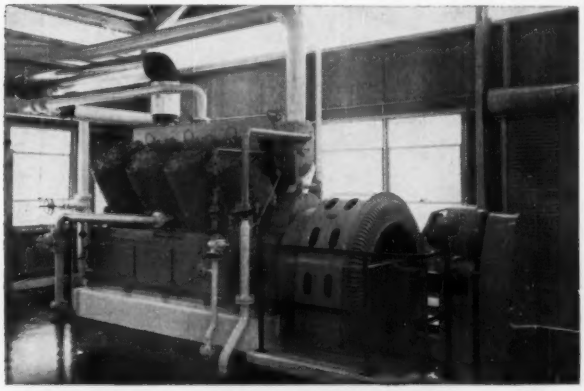
Liquid Burnisher, a new electrical contact cleaner and burnisher for all electronic equipment has just been introduced by Tankit Company. Just push the button, and one spray leaves contacts completely cleaned and burnished. Leaves no residue, will not stain and can't hurt the controls in any way. Prevents rust, corrosion, pitting, eliminates the possibility of scratching or damaging contacts, non conductive, non inflammable and non toxic. Each can contains approximately 300 applications for relays, breakers, solenoids, brushes, switches, controls, sockets, thermostats, etc.

Automatic Chemical Feed Conditions Cooling Water

You'll never get an argument from a smart engine operator about the value of cooling water conditioning. You may get some gripes on the difficulties of treatment. Treanor Corporation has an answer for this too. They have just introduced a low-cost, automatic proportional chemical feeder for water conditioning in evaporative cooling systems or systems where high makeup rates demand continuing treatment.

A dry inhibited acid material provides alkalinity and scale control. The feeder is installed in the makeup water line where it automatically feeds the dry chemicals in proportion to liquid flow rate. Holds pH constant, protecting engine . . . automatic feed with dry chemicals protects personnel.

Use your dp Reader Service Card.



INGERSOLL-RAND GAS ENGINES AND KITTELL SILENCERS

..An efficient power team!

Kittell's unique louvred design stops damaging back surge. As exhaust gases enter the silencer they are instantly bled off by a special perforated tube, then directed through louvres along the outer shell which cools them and reduces their volume. More louvres guide them back into the center of the silencer and then out into the atmosphere. This efficient design smooths pulsations, produces a whisper-quiet, exhaust flow. Available in a variety of sizes and designs for every noise application. Write for catalog.

Kittell

KITTELL MUFFLER and ENGINEERING, 1977 Blake Ave., Los Angeles, Calif.
17 years of experience in SILENCE!

Start using AVIEX

100% ETHEL ETHER pure through the last sprayed drop

Temperature-tested AVIEX Starting Fluid is sure for starting, safe for storage. Special propellant doesn't mix with pure ethel ether spray...will not liquefy in sub-zero temperatures. AVIEX is packed and tested in our own I.C.C. licensed plant.

Also available in 1-pint non-pressured cans.

AVIEX is recommended by Diesel Equipment Manufacturers—and endorsed by contractors.

FASTER, BETTER AND MORE STARTS PER CAN!

- Save Batteries
- Reduce Engine Wear
- Cut Labor Costs

see your service station or jobber...write direct for literature

AVIEX SERVES the DIESEL POWER FIELD

Kleer Flame fuel oil conditioner prevents combustion lag • pump corrosion • varnish and gum • clogged filters...and speeds injection.

UNITED STATES AVIEX COMPANY
423 NORTH 9th STREET • NILES, MICHIGAN

New Type Seal Saves That Oil!

Having trouble with oil retention? Looking for increased efficiency and service life on axles of trucks, buses, trailers?

Chicago Rawhide Manufacturing Company's new unit, called C/R Scotseal* (trademark for Self-Contained Omni-purpose Type Seal) claims to have these problems beaten with an entirely new concept in oil seal design that avoids what's been recognized as major causes of oil seal leakage.

This oil sealing lip is secured, completely enclosed so that it seals within the unit and does not contact the shaft. The seal provides the sealing surface. Thus, the C/R Scotseal precludes damage and leakage through assembly mishandling . . . during installation . . . or by improper shaft finish.

The sealing element is enclosed. Pre-lubricant applied during fabrication stays in place and lubricates the sealing lip through centrifugal action. The seal's protected, especially during starved conditions.

Company claims C/R Scotseal seals without leakage, runs cooler with less friction and torque and delivers greatly increased service life.

Use your dp Reader Service Card.

Stop That Racket!

You can try, now that the Korfund Co. has produced a new spray-on damping compound that drastically reduces vibration and noise in metal structures.

The new viscoelastic material, when sprayed or trowelled onto metal plate renders it acoustically equivalent to a sheet of cork. VIBRO-DAMPER compound could have good application where noise is a factor, as in vehicles. It's an economical treatment for sheet metal applications such as air ducts, plenums, pumps, fan scrolls, fire walls, etc.

Korfund asserts that it is 100 times as effective for vibration damping as a ½-in. thick 6-lb density glass fiber blanket; it handles like a coat of paint . . . non toxic, nonflammable. Available too, in fire-resistant form, and it is not affected by alkali, grease, diesel fuels, aliphatic oils, ozone or sunlight.

Don't be "Rusty"!

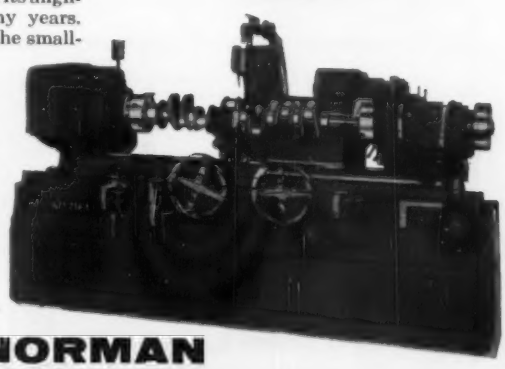
"Poly-Rustex", Brad Chemical's new, clear rust inhibitor compound gives long-lasting corrosion protection to new metals, penetrates deeply through existing corrosion without discoloring the metal.

What's more, one easy, economical application, whether brushed, sprayed, mopped or dipped onto the surface forms a solid air-and-moisture-tight seal that will prevent the formation of new rust.

"You can cut set-up time in half with a Van Norman 438 Crankshaft Regrinder!"

The greatest operation speed ever built into a crankshaft regrinder is now yours with the new Van Norman 438. It features pendulum-lever crankshaft alignment . . . 360° Rotary Heads . . . electro-matic table traverse . . . fast automatic wheel retraction . . . variable drive work head . . . quick-set outboard counterweights . . . dial-o-matic steady rest for fast location of crankshaft throws . . . built-in Bijur one shot oiling system . . . 18 x 46 capacity with 24" grinding wheel.

The 438 is sturdy, massively designed, and built to maintain its alignment and accuracy for many years. Moderately priced for even the smallest shop.



Designed by Van Norman . . . builder of precision machine tools since 1888 . . . all known speed methods of grinding crankshafts have been built into this entirely new and modern crankshaft grinder. 2371

Remember,
it pays to Van Normanize.

VAN NORMAN
Springfield 7, Massachusetts
A DIVISION OF VAN NORMAN INDUSTRIES, INC.

diesel power » new literature

Grind Your Crankshaft While In Place!

New brochure from Golten Marine Co., Inc. describes how this internationally-known organization can save you time and money when you've crankshaft troubles. Golten's specialists travel anywhere in the world—arriving within 24 hours—with Golten's special portable crankshaft reconditioning equipment. Main journals and crank pins on any size crankshaft for every make of industrial or marine engine are ground, honed, lapped, polished and completely reconditioned *while in place*. Unique feature of Golten's new brochure is a handy page with places for listing your various crankshaft measurements. Handy for you to have on file and data that would be required by them should you need their services. In addition, to general marine and industrial engine services, Golten Marine is a licensed repair shop and spare parts supplier for Burmeister & Wain, Gotaverken, Kockums and MAN.

Fuel Injection Equipment, Governor Sales and Service Booklet

If you're operating diesel equipment in the New York City-Long Island area, including surrounding New Jersey, Connecticut and New York State—if you are, there's a new 8-page Brochure that you're sure to be interested in. It's from A&D Diesel Service of Brooklyn and Farmingdale, L. I.

Leafing through it you get a complete rundown of what A&D offers in sales and service facilities for fuel injection equipment, governors and associated parts and supplies. Chock full of interesting photos showing complete and modern tooling available for service work . . . lists services and products available.

New Slide Rule Measures Truck Performance

Truck performance can be measured in just a few seconds with a new slide rule developed by the White Motor Company.

For instance, if you know engine horsepower, gross vehicle weight and road grade, one of the dual slides on the White truck performance rule will show the maximum driving speed. All directions for easy operation plus tables on tire rpm, air resistance hp and altitude and road surface correction factors are printed on the rule.

For Cleaner Pipelines

Removal of mill scale and other surface corrosion from pipe used in pipe lines through the use of Wheelabrator cleaning is the subject of an 8-page, 2-color bulletin issued by the Wheelabrator Corporation.

Detailed clarification of the airless blast cleaning principles, equipment and installations is included along with information on the company's steel abrasives used in the process.

Bulletin Describes Vari-Flow Pump

Simply "dial" the flow rate, from zero to full capacity, and without changing pump speed! Blackmer Pump Company's new variable capacity pump makes it all possible, according to a new 8-page bulletin. Bulletin 600, by means of cut-away illustrations of the four basic models, explains in detail the unique operating principle involved. Application data tables, selection procedures, performance curves as well as a basic discussion of simplified liquid proportioning now possible with the use of special systems incorporating one or more Vari-Flo pumps, are all included in the literature.

Use your dp Reader Service Card.

Telling the whole Hose Story

The Dayton Industrial Products Line is completely and conveniently outlined in a new 52-page catalog recently published by the company. It tells the whole story . . . industrial V-Belts, Cog-Belt and Poly-V types, sheaves, industrial hose. You get it all with sizes, dimensions and prices.

There's a special section dealing with hose. Fills you in on information about the company's line of molded braided, horizonal braided, machine-built wrapped fabric and woven jacket hose. Recommended hose applications for dairy, petroleum, construction and dredging fields also covered.

we do 1 thing - and we do it very well!

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Allis-Chalmers story

"Look to the TS-360" is a 15-min full color 16mm sound movie explaining the production, operating and mechanical advantages of the new 30-cu yd TS-360 motor scraper designed for use without the everyday "nuts and bolts" approach. The film, now available, tells the story of a contractor designing an all-hydraulic motor scraper to meet his actual field requirements.

Also available are two new pieces of literature featuring the TL-14 tractor loader. They're chuck full of info on the two transmissions for the 83-hp unit, and another, covering the recently introduced TL-12 tractor loader. The TL-14 boasts an 83-hp diesel and the TL-12, a 76.5. The "14" has a 5300-lb carrying capacity and the "12", 4000-lb.

Tool Talk

Owatonna Tool's just published a 16-page 2-color hand tool catalog detailing its wide variety of hand tools including OTC wrenches, pliers, cutters, screw drivers, punches, chisels, sockets, handles, extensions, socket sets, tool sets, chests, feeler gauges, and miscellaneous tools.

"Tinius Talks About Olsen-Rava Electro-Dynamic Balancing Machines"

That's the title of an informative little 8-page bulletin we've just received from Tinius Olsen Testing Machine Company. It covers two lines of balancing machines—the Type S for small parts from 1-oz to 22-lb . . . and Type D for heavier parts to 66,000-lb and even heavier!

Describes how T-O's Type S balances within tolerances as small as 10 micro-inches. (Amount of unbalance being shown on a meter, while a stroboscopic light "freezes" a correction mark on the part to indicate "angle" of unbalance).

There's also information in this bulletin on T-O's Type D. This model gives you direct indication of both the angle and the amount of unbalance. Eliminates guesswork, permits balancing to tolerances within 10 micro-inches. Bulletin includes helpful details on how you can use either machine for single part balancing or set it up for production runs. Good balance is becoming one of today's routine requirements. Better take a look at this new bulletin.

How About These Engines For Profitable Tank Truck Hauling?

Detroit Diesel Engine Division of General Motors Corporation has made available a new 6-page fold-out brochure entitled: "Series 53 and 71 Engines for Profitable Tank Truck Hauling." Here's complete horsepower data on the 97 to 290-hp automotive engines covering in-line and Vee models. You'll find illustrations and dimensions of Detroit Diesel's 6V-53, 6V-71 and 8V-71 engines, too.

Catalog Features Complete Farris line

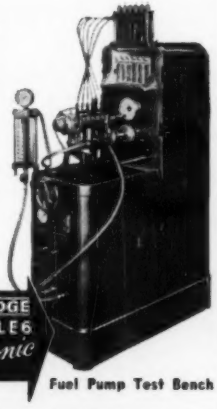
A new 28-page catalog describing and illustrating the complete Farris line of Safety Relief Valves for marine, fire pump services . . . hydraulic pressure systems, liquified gases, chemical corrosive and general industrial services has just been published by Farris Engineering Corp.

A new series of low cost, compact, Safety-Relief Valves is cataloged for the first time. All other Farris products are also briefly described.

The perfect trio...

. . . for the Diesel repair shop. Provides the necessary equipment for running essential tests on injection units and for re-conditioning injector nozzles.

Write for details today on utilizing this perfect trio for outfitting the smaller service shop at moderate initial cost—or on adapting the units to speed service techniques in any repair shop.



Fuel Pump Test Bench

For testing and calibrating all types of fuel pumps . . . provides utmost accuracy . . . rapid and easy to operate . . . combines rugged modern design.

Hartridge Nozzle Grinding & Lapping Machine

Insures perfectly concentric nozzle bodies and needles with a fine finish. Its immense scope, speed and ease of operation cut nozzle servicing costs.

HARTRIDGE

Universal Nozzle Analyser

Permits fast, accurate nozzle testing with precise observation of entire nozzle action and spray pattern.

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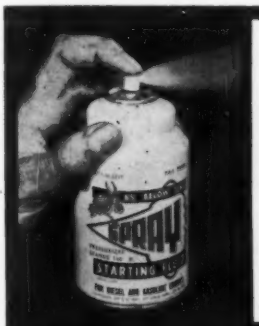


START ENGINES EVERY DAY WITH SPRAY...

STARTING FLUID FOR DIESEL & GASOLINE ENGINES

Get more starts, quicker starts, at lower cost with SPRAY STARTING FLUID. Both the fluid and propellent burn . . . there's no waste! Each pressurized can contains enough fluid for many starts . . . starts that will sustain combustion until a smooth running engine can take over. Our greater supply of "vapor pressure" at all temperatures, atomized at a high initial rate, shortens cranking and warm up time, reduces dilution, prevents electrical and starting system wear, saves wasted man hours and equipment down-time. SPRAY is atomized for safe application and quantity control . . . use only as much as the engine requires. Field-proven SPRAY STARTING FLUID will start the toughest engine down to 65° below zero . . . but for year 'round economy start engines every day with SPRAY! Sold through automotive jobbers everywhere.

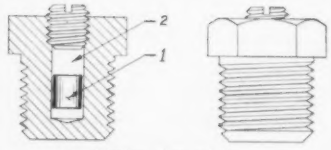
Ask about INSTNSTART closed system starting.

Insist on the can with the "balky donkey" trademark.

SPRAY PRODUCTS CORPORATION
P. O. Box 844 • Camden 1, New Jersey

Proof of Engine Overheating

HEAT-TEC fuses threaded into water jacket will indicate if engine has exceeded safe operating temperatures, which could result in cracked heads or blocks, or piston or bearing failure.



1. Floating alloy pellet
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Safeguard yourself against unjust claims. Floating pellet melts at 255 degrees F. and fuses with brass fitting. This is a permanent record of high temperature.

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KITTREDGE, COLORADO

CORPORATION EXECUTIVE HOUSEBOAT

Now in the Bahamas under U. S. Government charter, this diesel propelled houseboat is custom designed for executive relaxation or client entertainment. Private cabins for 16. Priced to sell at well under Lloyd's insured value of $40,000. Extra Equipment includes two 21' inboard cruisers; four bonefish skiffs with outboards. Write Box #A7-60, c/o Diesel Power, 80 Lincoln Ave., Stamford, Conn.

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FOR THE LEADING TRUCK DIESELS

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Volume production on automatic machines means SAVINGS
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Sold by all parts houses

BELL DIESEL RESEARCH

Pioneers in research and manufacture of high speed diesel injection equipment.
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D.P.S. THERMOMETERS

These instruments are a series of marine type thermometers designed for all diesels and all plant uses—water or oil.

FEATURES All brass construction, nickel finish, cork insulation.

(Repair service available)

No. 416H No. 426F
Price
$6.75 ea $5.70 ea

40 years continuously in the diesel engine business.

Write for catalog.

DIESEL PLANT SPECIALTIES CO.
Box 316
Stevens Point, Wisconsin

PEOPLE AND PLANTS . . .

(Continued from page 25)

Wiley to Atlanta For Mack

Mack Trucks has named **Clinton W. Wiley** Atlanta district manager. He will be responsible for sales, service and distributor management in 148 counties throughout Georgia and southern Tennessee.

Mr. Wiley's been with the motor truck industry for 27 years and with Mack in southern Georgia for the past three.

Expansion . . . .

Diesel Injection Sales and Service, Norfolk, Va., expects to complete its new headquarters plant and office late this year, according to **H. E. Wittersheim,** president. The modern, $250,000 structure will be fully air-conditioned, with 28,000-sq ft of floor space making it three times the size of the present plant. Added equipment will include Clayton 500-hp chassis and engine dyamometers.

Diesel Injection specializes in fuel injection units and allied equipment for the railroad, marine, motor transportation, construction and power industries. It also supplies the Leslie Hartridge test and repair equipment to the entire diesel industry in the U.S.

Distributor Doings:

• Keeping pace with expanding markets, top men are moving up and about at **Stewart & Stevenson, Inc.,** diesel engine distributors. **Joe Manning,** who was V.P. and General Manager has been named Executive Vice President. Stepping up as General Manager is **Charles Ward** who was serving as Assistant.

A policy shift affecting branch operations finds **Dick Connolly,** formerly South Texas District Manager in Corpus Christi, now Coordinator of Branches, with responsibility for much of the branch management under his jurisdiction.

Dick Grant was appointed Branch Manager of the San Juan Branch now functioning as a full branch operation, rather than as an offshoot of the Corpus branch.

Other shifts include: **Tom Langham** Credit Manager to Assistant to the General Manager with offices in Houston; and **Dick Anderson,** formerly with the C.I.T. Corporation, Credit Manager. **N. N. Elkins** takes over as Corpus Christi Branch Manager and **Howard Perkins** will be in charge of the Beaumont operations that was formerly a part of the Houston organization.

L. D. Howell, Houston Service Manager, has been transferred to the Houston Sales Department, assigned to the Petroleum Industry Sales Division. **Harold Vaughan** is now Service Manager.

• **David H. Griffin** has been elected president of the **Griffin Corporations,** comprising Griffin Equipment Corp. and Griffin Wellpoint Corp., succeeding the late Hugh J. Hush.

Mr. Griffin, who was executive vice president of the companies, has been purchasing agent, vice president and treasurer. He joined the Griffin Corporations in 1950 after Navy service in World War II. He is a graduate of Lehigh University.

Mr. Griffin is the son of the late Timothy G. Griffin, founder of the companies.

In other management moves, **David A. Werblin** has been elected vice president and general sales manager of Griffin Wellpoint, manufacturers and suppliers of wellpoint systems for the construction industry.

James S. McConville takes over as vice president and general manager of Griffin Equipment, New York and New Jersey distributor for Detroit Diesel Engines, Allison Torquematic Transmission and Delco Products, all divisions of GMC.

• **Lister-Blackstone, Inc.** has announced the appointment of dealers and distributors to handle their Diesel engines. Distributors include: Shelley Tractor & Equipment Co., Miami, Florida; Lister Sales & Service, Great Bend, Kansas; and Andrews & Andrews Equipment Co., Portland, Oregon. Dealers added are Atlanta Equipment Co., Atlanta, Ga.; Michigan Generator Service, Detroit, Mich.; Engines, Inc., Chicago, Ill.; and Nelson Equipment Co., Tucson, Arizona.

This adds up to Lister facilities all over the United States!

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STAMFORD, CONN

Line Boring . . .

(Continued from page 39)

centerline. Block movement as little as 0.001-in. was now practical.

This is important in set-up to bore saddles. Saddles must be restored to original size as the OD's of precision-type bearings are standard. When the bore is out-of-round, frequently due to cap-stretch, the hole must first be closed up. This is done by removing metal from the cap at the parting line to reduce its crown diameter. The fact that the amount of metal removed must be controlled and also that the finished surface must be square with the cap's side faces made this a ticklish job. This led to development of a special Cap Miller (DIESEL POWER, October, 1958) to do a controlled, precise job.

With the reworked cap torqued in place, accurate block positioning pays off. Newly-bored holes should be on the original centerline so that piston height in the cylinder and gear centers in the timing train are not altered. To avoid lowering the crankshaft in the block an absolute minimum of material should be removed from the block-half of the bore, the major amount of metal removal taking place in the cap. This explains the extreme importance of precise block positioning with respect to the boring bar's centerline.

New Tobin-Arp model . . .

Prior to 1947, there was only one line-boring machine model manufactured by the Tobin-Arp. This was their model TA-14, with capacity sufficient to line bore crankcases up to 72-in. length.

However, at this time, demand for larger equipment became so great that the Tobin-Arp felt justified in developing the TA-15 Line-Boring Machine—it has sufficient capacity to align bore crankcases up to 96-in. length. It comes fully equipped for precision work including having a tool support to eliminate cutter vibration on large diameter bores.

All models are equipped with electric bar drive and hydraulic feeds, adjustable to any desired rate. They can be set for maximum cutting speeds for the type of material and hole size with assurance of extremely fine finishes. Rigid boring bar bearing supports let you bore steel and cast iron under the most difficult conditions. Boring capacities on the two models is 1 3/16-in. to 8-in. bores. And, of course, all the features mentioned are applicable to camshaft bearing bores, in fact, this job can often be done with the same block set-up and only readjustment of the support arms.

Look beyond that price tag . . .

So when you're buying a tool today it pays to "shop around"—*but not on a price tag basis alone.* What you want is a tool that will increase your accuracy to the point of precision . . . one with productive capacity that will reduce labor costs per job to a minimum. Profitable engine rebuilding depends on your doing this! Don't make the mistake of the mason with the cheap level—the level isn't "cheap"—*it's costing him money every hour he uses it.*

Now you can eliminate smell and irritants in diesel exhaust . . . and improve economy and performance in the bargain

Vitasul

Proved key to clean power

Used by British Railways; DeHavilland Aircraft; Rolls Royce Ltd.; Monsanto Chemical Ltd.; many others here and abroad.

Just 1 gallon of Vitasul treats 150 gallons of diesel fuel: ideal in bulk tanks.

Low cost: pays for itself in added mileage and longer engine life.

Discover Vitasul, the new key to clean power! Get all the facts now.

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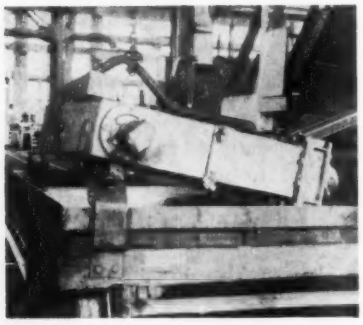
MANUFACTURES OF ADECO FUEL INJECTION SYSTEMS



Lifting Jig for EMD Locomotive Oil Coolers

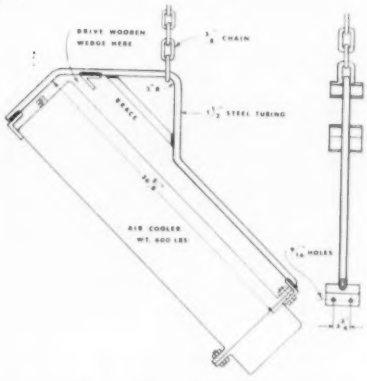
Oil coolers on EMD GP 9 road-switching locomotives are awkward to remove and replace with the slings, chains and lift gear normally available. They are located at a 45-deg angle between the oil filter housing and the water tank. The job is made easier and safer both for the equipment and for personnel by a well-designed, shop-built lifting jig.

Steel 1½-in. tubing was found to have ample strength for the 600-lb cooler weight. It was bent as shown, care being taken that the center of gravity was under the suspension point with the cooler at the 45-deg angle. Holding ends were made of ⅜-in. by 3-in. angle iron, 5-in. long, welded to the tubing. The lower angle is drilled with two 9/16-in. holds on 3¾-in. centers to match the bolt spacing on the cooler.

The cooler rests against the angle iron at the other end. The intermediate angle is modified as shown and also placed at an angle. A wooden wedge with a taper matching this angle is driven in to grip the cooler's top end. This provides a safe, balanced means of lifting when the jig is centered laterally.

However, it may not be desirable to get a center lift. Coolers are removed and installed sideways. They rest on angle-iron support brackets. It is convenient to get an off-center lift as this permits the cooler to be pulled out or inserted roughly half way, while still supported on the mounting brackets, for attachment or removal of the lifting jig. For off-center lifting a balancing counterweight is handy.

A clamp was made of 3-in. angle iron. It fits over the end of the cooler and locks with two set screws. Its center has a tubular socket and lock screw to accept a 2-in. bar.



Oil cooler lifting device designed to be used with crane. It simplifies job of lifting heavy 600-lb oil coolers on EMD GP 9 road-switching locomotives.

We mount the jig with a 4-in. offset and have a length of bar that has the proper weight to provide balance.

While this lifting jig has a specific purpose that limits its use to railroad shops, the principle of specialized lifting gear has broad application. If you've got a troublesome handling job, start some head-scratching. Standard engineering reference books will give you the information to design for safety. And don't forget to include a safety factor, preferably of about four. You can cut job time and improve safety.

Submitted by H. W. Stowell, Albuquerque, New Mexico.

OIL CONDITION INDICATING METER

REDUCE WORKLOAD ON OVERHAUL SHOP BY 1/3

On an average, metered engines can outlast the unmetered by a good one third.

Details gladly sent. Diesel? Gasoline? How many in use?

BEST KNOWN NAME IN OIL TESTING

THE GERIN CORP.

Box B, Avon, N. J.

Filter Your Transmission Oils

Fuller points out that clean lubricants are your best insurance against gear and bearing wear. Today's transmissions are handling more power at higher speeds . . . fits are close and loadings high. Any dirt, free to circulate, can do a lot of damage.

Dirt gets in . . . transmissions have to breath. But don't help it get in. How are your practices—during service checks and addition of oil? Are you taking steps to exclude dirt? You better, and then hedge your bet with one of Fuller's new transmission oil filters.

This is a simple, complete and inexpensive unit incorporating a honeycomb-wound cotton filter element. Installed on power take-off openings of most transmissions. That's it. Fuller recommends 10,000-mile replacement in highway service; 1000 hours in off-highway applications; and 500 hours in this service when dirt-moving, mining and similar "dirty" application is involved.

Summer—When Cooling Troubles Blossom

This is the season of the raised hood. Check any parkway. For car owner's with overheating engines some excuse—not much—can be offered. But for commercial operators, none. If you ran a good PM check in the spring, fine. Just resolve to do it again before winter sets in and again in the spring.

If you didn't check out the cooling system, you can expect trouble sooner or later. And it's easier to prevent troubles than to fix them. Here are some of the more important things to do:

1. Evidence of scale, rust or corrosion calls for flushing, cleaning and if scale is bad, de-scaling.
2. Check water pump condition. Eroded impellers, air leaks into pump reduce water circulation.
3. Look for leaks—water out of the system; air or gases into it.
4. Check hoses including internal condition.
5. Check fan belt condition and tightness.
6. Then fill system with clean, soft water that is properly inhibited.
7. Check water level frequently.

Do this in the spring—or even now—and you can assume a superior attitude each time you pass a "boiler."

To Pre-Clean or Not to Pre-Clean . . .

There seems to be no question that pre-cleaners will improve an air cleaner's service life. There is question about what they do to cleaning efficiency—particularly with oil bath-type filters.

Some engine builders, Detroit Diesel for one, do not recommend use of any pre-cleaner with an oil bath-type cleaner. With dry-type cleaners, they're okay, in fact, most manufacturers of such filters incorporate some type of pre-cleaner in the unit.

It gets back to dirt particle size. Many of the larger particles are agglomerates of fine particles and after going through the centrifugal action on which most pre-cleaners depend for effectiveness, agglomerates are broken down into their component fines.

While the average efficiency of oil-bath cleaners is high, they are slightly less efficient for fine particles than for the larger ones. Thus, the higher the percentage of fines, the lower the average cleaning efficiency. More dirt gets in to the engine.

In contrast, efficiency of dry type cleaners is practically constant, regardless of particle size. Use of pre-cleaners increases filter service life without measurably affecting cleaning efficiency.

Watch GM Oil Ring Expander Installation

Be very careful when installing oil control rings with accordion-type expanders on Series 53, 71T and 110T engines to be sure that expander ends don't overlap. This can cause broken or chipped rings and with loss of oil control, consumption will go up.

Expander must seat completely to the back of the ring groove (make sure it's perfectly clean). Then make sure there's no overlap of expander ends. If there is, the double thickness pushes out the ring when it is installed over the expander. Ring and expander may be broken when the ring compressor is installed or when the piston is inserted in the liner.

Check during expander installation and then pay attention when installing the ring compressor over the rings. If there is expander overlap, a noticeable resistance should be felt as the compressor goes over the ring. If so, do it over and right!

It'll Pay You To Use Right Puller on GM Liners

Euclid emphasizes in their service subjects that when pulling liners in GM engines, procedures recommended in the service manual should be followed exactly. You'll save time and trouble by using the shock pullers built for this job.

Specific warning is issued against makeshift methods, particularly the poor practice of using a belt or other object in the ports, barring the engine over, and pushing out the liner with the piston.

A long list of damages can result, starting with damage to the liner ports. Also, it's hard on the piston and on engines equipped with pistons having fire rings, damage to the piston edge and collapse of the fire ring groove is a good possibility. *Do it right!*

Don't Restrict Flow!

And that goes for fuel, lube oil, cooling water and air. Several cases have been seen recently where wrong-sized piping, hoses or incorrect fittings have been used—too small a hose to a lube filter some distance from the engine . . . a street-ell in a water line already minimum size. Restrictions, even if you get enough flow volume, make the pump work harder. In the case of air, the engine's the pump and you may not be getting all you need for good combustion. Most manufacturers can give you the right data—use it.

OIL CONDITION INDICATING METER

TAKES UNCERTAINTY OUT OF LUBRICATION

A meter to keep from running on oil when it is unfit for lubrication, and to keep from draining when you shouldn't drain.

You get less wear, less labor, less downtime and use less oil.

Details free. Please state how many diesels and gasoline.

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on 30% LESS AIR...
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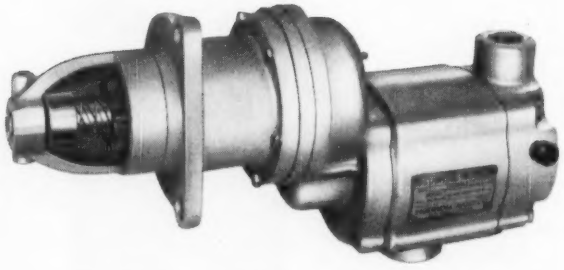

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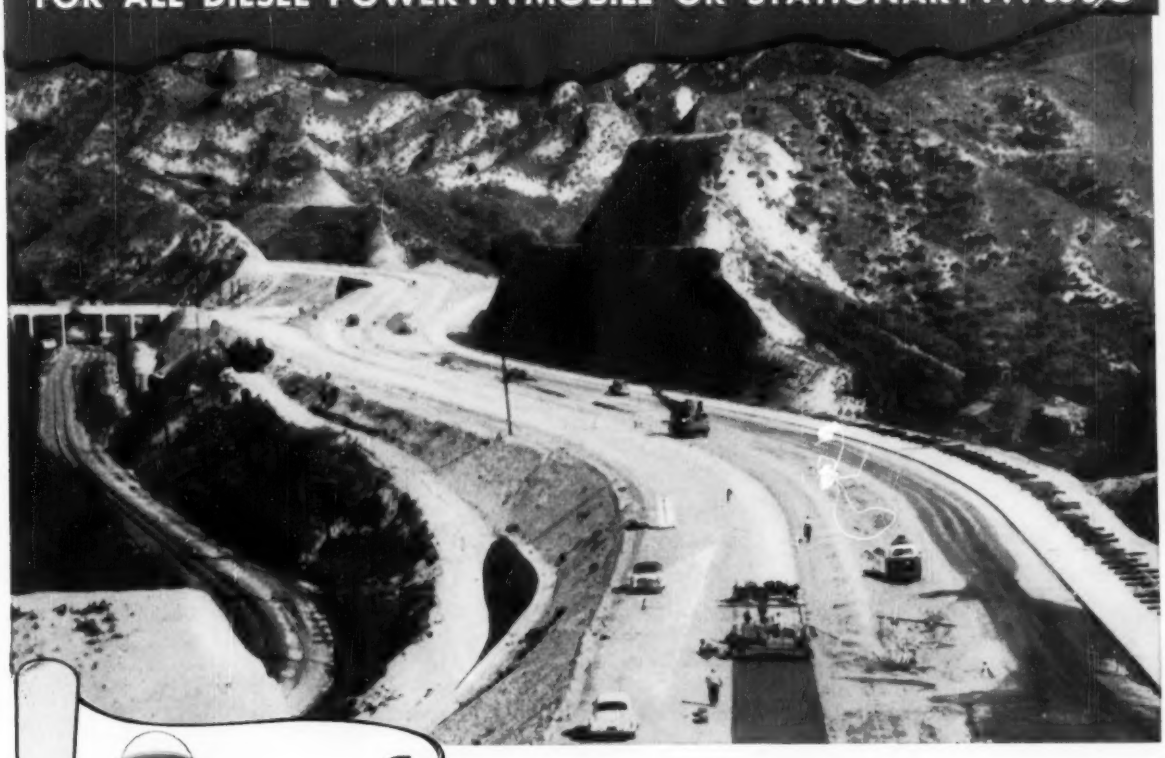

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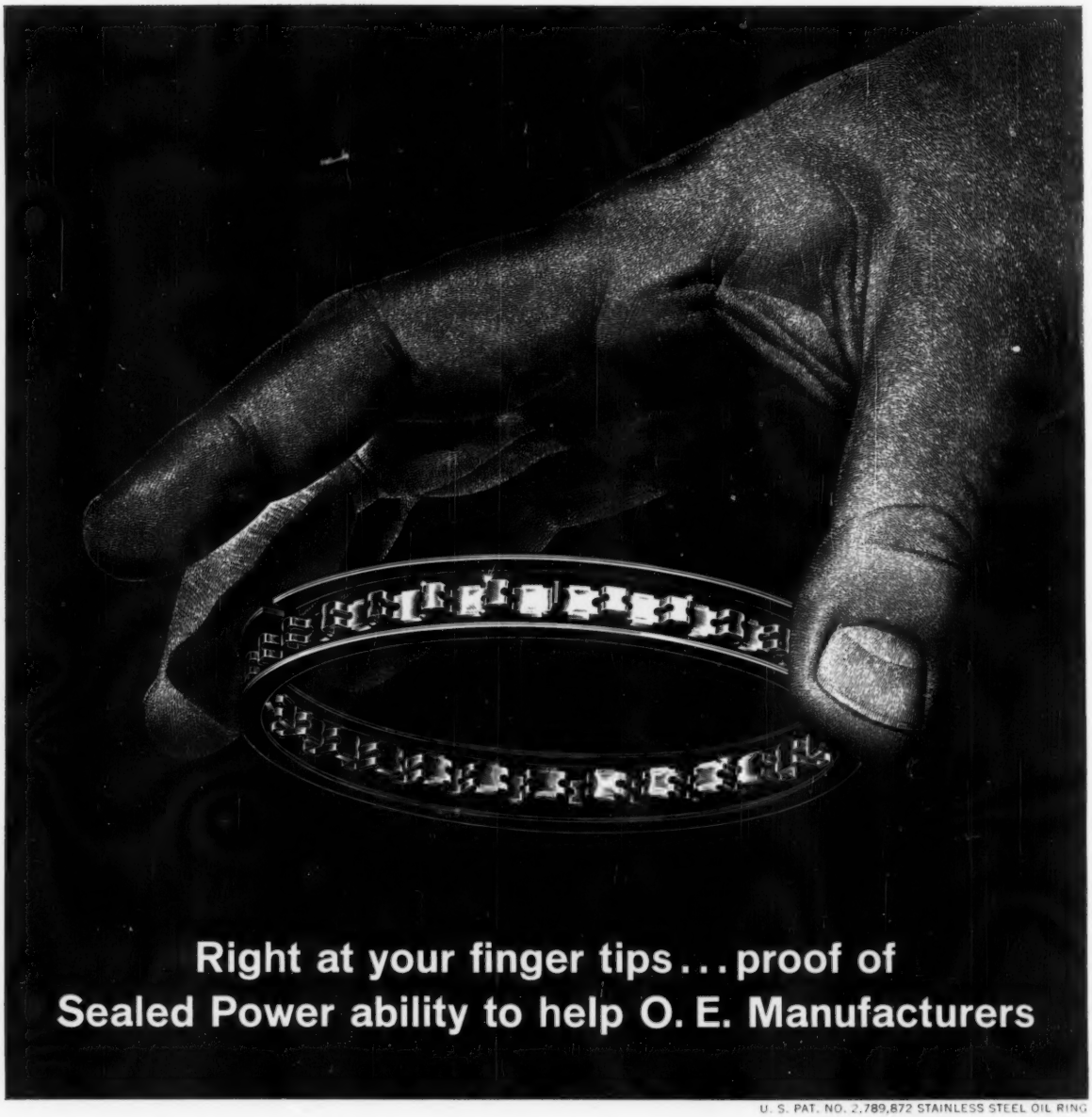

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